

FH-150R

SERVICE MANUAL

AEP Model
UK Model
E Model



- FH-150R consists of ST-177R, TA-177R, TC-177R and APM-177M.
- Remote commander RM-177R is supplied accessory.

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CONTENTS

FH-150R	Page	ST-177R (E model)	Page
FEATURES	2	REPAIRING PRECAUTION	ST-1
SPECIFICATIONS	3	SECTION 1 BLOCK DIAGRAM	ST-2
MODEL IDENTIFICATIONS	4	SECTION 2 ADJUSTMENTS	ST-3
CONNECTION BETWEEN EACH SET	5	SECTION 3 DIAGRAMS	
FUNCTION OF CONTROLS	6	3-1. MOUNTING DIAGRAM	ST-7
EXPLODED VIEW AND PARTS LIST	8	3-2. SCHEMATIC DIAGRAM	ST-9
ST-177R (AEP, UK model)		SECTION 4 EXPLODED VIEW AND	
REPAIRING PRECAUTION	ST-1	PARTS LIST	ST-12
SECTION 1 BLOCK DIAGRAM	ST-2	SECTION 5 ELECTRICAL PARTS LIST	ST-13
SECTION 2 ADJUSTMENTS	ST-3		
SECTION 3 DIAGRAMS	ST-7		
3-1. MOUNTING DIAGRAM	ST-7		
3-2. SCHEMATIC DIAGRAM	ST-9		
Semiconductor Lead Layouts	ST-12		
SECTION 4 EXPLODED VIEW AND			
PARTS LIST	ST-13		
SECTION 5 ELECTRICAL PARTS LIST	ST-14		

—Continued on page 2—

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.



**COMPACT HI-DENSITY
COMPONENT SYSTEM**
SONY®



TA-177R	<u>Page</u>	<u>Page</u>
1. IC'S OPERATION	TA-1	SECTION 5 EXPLODED VIEWS AND
2. SERVICING NOTE (G-AEP model only)	TA-4	PARTS LIST
3. DISASSEMBLY	TA-5	TC-26
4. BLOCK DIAGRAM	TA-8	SECTION 6 ELECTRICAL PARTS LIST
Semiconductor Lead Layouts	TA-11	TC-31
5. MOUNTING DIAGRAM	TA-12	
6. SCHEMATIC DIAGRAM	TA-17	
7. EXPLODED VIEWS AND		
PARTS LIST	TA-23	
8. ELECTRICAL PARTS LIST	TA-25	
TC-177R		
SERVICING NOTE	TC-2	
SECTION 1 BLOCK DIAGRAM	TC-3	
SECTION 2 DISASSEMBLY	TC-5	
SECTION 3 ADJUSTMENTS		
3-1. MECHANICAL ADJUSTMENTS	TC-11	
3-2. ELECTRICAL ADJUSTMENTS	TC-15	
Semiconductor Lead Layouts	TC-18	
SECTION 4 DIAGRAMS		
4-1. SCHEMATIC DIAGRAM	TC-19	
4-2. MOUNTING DIAGRAM	TC-23	

FEATURES

Compact hi-density component system with simple operation

Consists of an FM stereo FM-AM tuner, a high quality cassette deck, and an integrated amplifier, each of which can be connected quickly and securely. The functions are switched directly.

Supplied remote commander for remote control operation

Allows you to control the whole system from a distance.

Amplifier with power output of 40 W + 40 W (1 kHz, 5% THD) for AEP, AED, UK models, with peak music power output of 320 W for E, EA3 models

- Includes a 7-band graphic equalizer controls for fine adjustment of tone quality for both recording and playback, and a 7-band spectrum analyzer.
- Microphone mixing jack and microphone level control.

High sensitivity and high selectivity tuner

Permits extremely precise tuning of FM/MW/LW stations (for AEP, AED, UK models) or FM/MW/SW₁/SW₂ stations (for E, EA3 models) using the electronic digital readout on the frequency display. Five stations on each band can be memorized.

Auto-reverse cassette deck with select cassette-deck operations

- B-type and C-type Dolby NR circuit incorporated
- Automatic tape select system
- Automatic music sensor (AMS)
- Automatic recording level control system

3-way speaker system with APM woofer

By installing speaker boxes in the appropriate position, the localization of the sound can be arranged to fit your listening situation.

Newly-developed AMFB (Accurate Motional Feedback) function

Feeds back movement of Aluminum Honey-comb diaphragm on the speaker to the amplifier as electric signal in order to obtain sufficient bass sounds like a larger speaker system.

FH-150R FH-150R

SPECIFICATIONS

ST-177R

System FM stereo, FM/AM superheterodyne tuner
Quartz-locked PLL digital synthesizer system

FM tuner section

Tuning range	87.5 – 108 MHz
Antenna	Telescopic antenna
Antenna terminals	75 ohms unbalanced
Intermediate frequency	10.7 MHz
Usable sensitivity	2.3 μ V (S/N = 30 dB/75 ohms)
Signal-to-noise ratio	78 dB (mono) 70 dB (stereo)
Harmonic distortion at 1 kHz	0.2% (mono) 0.5% (stereo)
Separation at 1 kHz	40 dB
Selectivity at 400 kHz	55 dB

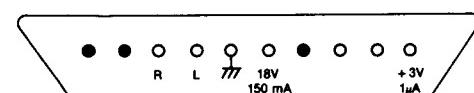
MW/LW tuner section (for AEP, AED, UK models)

	MW	LW
Tuning range	522 – 1,611 kHz	144 – 288 kHz
Antenna		Built-in ferrite bar antenna External antenna terminal
Intermediate frequency		450 kHz
Usable sensitivity	Built-in ferrite bar antenna 250 μ V/m (999 kHz)	500 μ V/m (230 kHz)
External antenna	100 μ V (999 kHz)	150 μ V (230 kHz)
Signal-to-noise ratio	52 dB (50 mV/m)	
Harmonic distortion	0.3% (50 mV/m, 400 Hz)	

SW/MW tuner section (for E, EA3 models)

	SW 1	SW 2	MW
Tuning range	3.2 – 7.3 MHz	9.5 – 21.75 MHz	531 – 1,602 kHz (at 9 kHz step) 530 – 1,610 kHz (at 10 kHz step)
Antenna		Built-in ferrite bar antenna External antenna terminal	
Intermediate frequency		450 kHz	
Usable sensitivity	Built-in ferrite bar antenna —	250 μ V/m (999 or 1,000 kHz)	
External antenna	23 μ V (5 MHz)	30 μ V (15 MHz)	100 μ V (999 or 1,000 kHz)
Signal-to-noise ratio	50 dB (5 mV)	52 dB (50 mV/m)	
Harmonic distortion	0.3% (5 mV, 400 Hz)	0.3% (50 mV/m, 400 Hz)	

10-pin DC input connector of ST-177R



General

Dimensions Approx. 215 x 55 x 240 mm (w/h/d)
(8 1/2 x 2 1/4 x 9 1/4 inches)
incl. projecting parts and controls

Weight Approx. 0.9 kg (2 lb) net

TC-177R

Recording system 4-track 2-channel stereo
Frequency response DOLBY NR OFF (DIN)
With TYPE IV cassettes (Sony METAL-S)
30–16,000 Hz (\pm 3 dB)
With TYPE II cassettes (Sony UCX)
30–15,000 Hz (\pm 3 dB)
With TYPE I cassettes (Sony HF-S)
30–14,000 Hz (\pm 3 dB)

Wow and flutter 0.07% WRMS (NAB)
 \pm 0.2% (DIN)

Dimensions Approx. 215 x 115 x 240 mm (w/h/d)
(8 1/2 x 4 1/4 x 9 1/4 inches)

Weight Approx. 2.3 kg (5 lb 2 oz) net
13-pin DC input connector of TC-177R

TA-177R

Continuous RMS power output (AEP, AED, UK models)
40 + 40 watts
(6 ohms, at 1 kHz, 5% THD)
30 + 30 watts
(6 ohms, 40Hz – 20 kHz, 1% THD)

Peak music power output
320 W (6 ohms) (E, EA3 models)

Inputs

	Sensitivity	Impedance
PHONO (phono jacks)	2.5 mV	50 kilohms
CD/AUX (phono jacks)	250 mV	50 kilohms
MIC (phone jack)	1 mV	low impedance

Outputs

PRE OUT (phono jacks)	Voltage 250 mV, Impedance 4.7 kilohms
HEADPHONES (stereo phone jack)	Accepts headphones of 8 ohms or more
SPEAKER	Accepts only the APM-177M

Frequency response PHONO: RIAA curve \pm 0.5 dB

CD/AUX 40 Hz – 30 kHz $^{+0}_{-3}$ dB

MIC: 100 Hz – 10 kHz $^{+0}_{-3}$ dB

Dimensions Approx. 215 x 115 x 235 mm (w/h/d)
(8 1/2 x 4 1/2 x 9 1/4 inches)

Weight incl. projecting parts and controls
Approx. 4.5 kg (9 lb 15 oz) net

APM-177M

Speaker system 3 way speaker system
Speaker units Woofer: 110 cm² APM type
Tweeter: 5 cm dia, cone type
Super tweeter: 3.5 cm dia, cone type

Enclosure type Bass reflex
Frequency range 30 Hz – 20 kHz (AMFB switch ON)
60 Hz – 20 kHz (AMFB switch OFF)

Sensitivity 90 dB/W/m
Impedance 6 ohms

Dimensions Approx. 170 x 280 x 220 mm (w/h/d)
(6 1/2 x 10 1/2 x 8 1/4 inches)

Weight Approx. 3.1 kg (6 lb 14 oz) net per speaker

General

Power requirements AEP, AED models: 220 V AC, 50/60 Hz
UK model: 240 V AC, 50Hz
E, EA3 models: 120, 220 or 240 V AC
adjustable, 50/60 Hz

Power consumption 90 watts

Dimensions Approx. 570 x 345 x 230 mm (w/h/d)
(22 1/2 x 13 3/4 x 9 1/4 inches)

Weight incl. projecting parts and controls
Approx. 14.6 kg (32 lb 3 oz) net
Approx. 16.4 kg (36 lb 3 oz) in shipping carton

MODEL IDENTIFICATIONS

TC-177R has no difference by the model.

ST-177R

SONY MODEL NO. ST-177R

FM STEREO/FM-AM TUNER

FREQUENCY RANGE:

IF: FM 10.7 MHz AM 450 kHz

SERIAL NO.
MADE IN JAPAN

FM: 87.5 – 108 MHz SW₂: 9.5 – 21.75 MHz } E, Saudi Arabia
SW₁: 3.2 – 7.3 MHz MW: 531 – 1,602 kHz } models

FM: 87.5 – 108 MHz MW: 522 – 1,611 kHz LW: 144 – 288 kHz } AEP, Denmark
G-AEP, UK models

BLANK E, E₃ models
E₂ E₂ model

SONY MODEL NO. APM-177M

SPEAKER SYSTEM

IMPEDANCE:

SERIAL NO.
MADE IN JAPAN

BLANK E₂, E₃ models
POWER HANDLING CAPACITY: 40W (NOM) E model
80W (MAX)

SONY MODEL NO. TA-177R

INTEGRATED STEREO AMPLIFIER

AC: [Hatched area]

SERIAL NO.
MADE IN JAPAN

AEP, Denmark
220V ~ 50/60Hz 90W models
240V ~ 50Hz 170W UK model
120/220/240V ~ 50/60Hz 90W . E₂/E₃, Saudi Arabia models

G-AEP

• This label is stucked on TA-177R (G-AEP model).

SONY MODEL NO. FH-150R

COMPACT HI-DENSITY COMPONENT SYSTEM

ST-177R: FM STEREO/FM AM TUNER

TA-177R: INTEGRATED STEREO AMPLIFIER

TC-177R: STEREO CASSETTE DECK

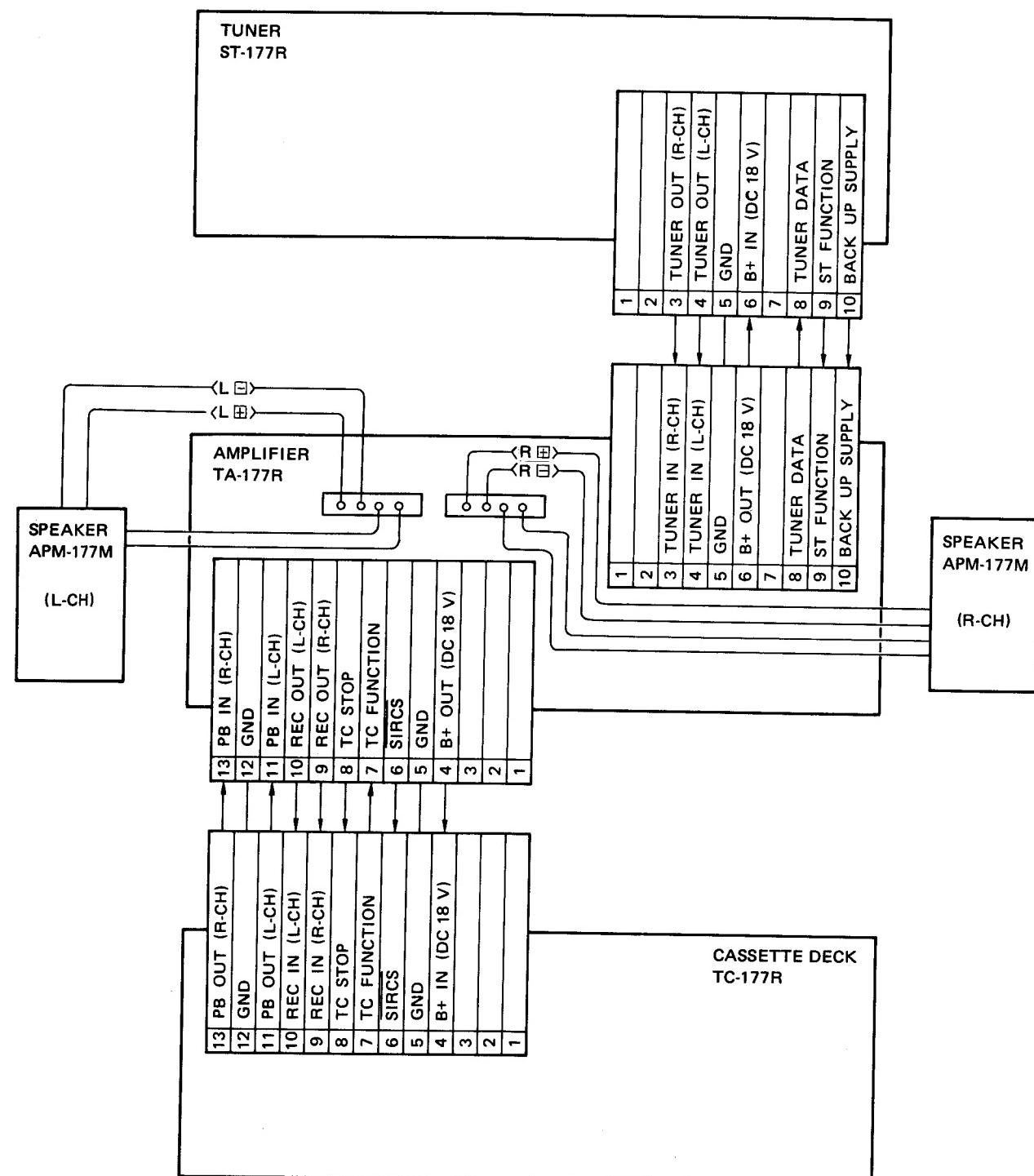
APM-177M: SPEAKER SYSTEM

AC: 220V ~ 50/60Hz 90W

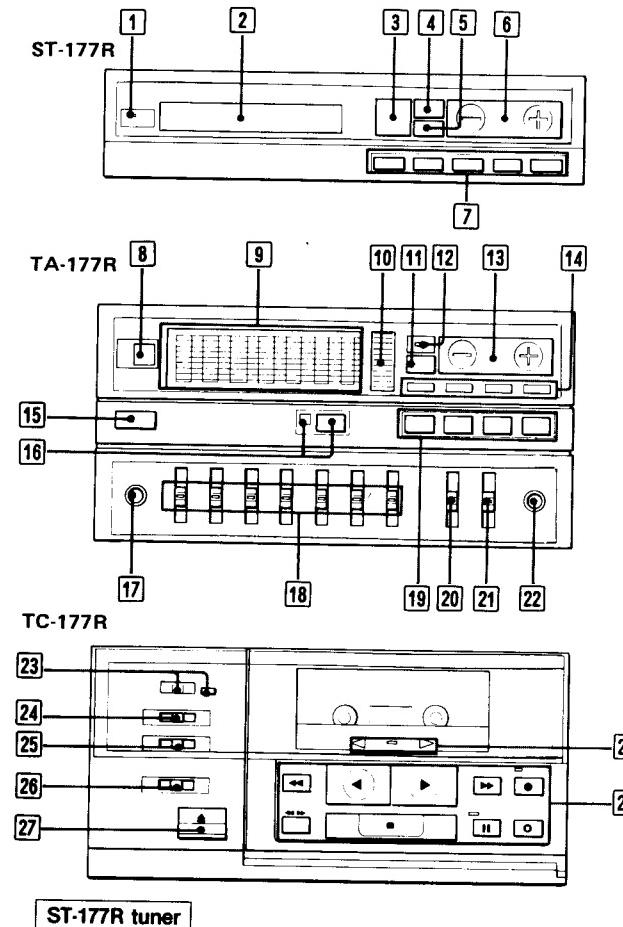
FTZ
31/585S

SERIAL NO.
MADE IN JAPAN

CONNECTION BETWEEN EACH SET



FUNCTION OF CONTROLS



- ⑥ TUNING button**
Press the "+" side to tune in a higher frequency, and the "-" side to tune in a lower frequency. To change the frequency rapidly, keep the button pressed.
- ⑦ PRESET buttons**
Press the appropriate button to memorize a tuned-in station or to call up a memorized station.
- ⑧ ■ REMOTE SENSOR**
Receives the infrared ray command transmitted from the supplied RM-177R remote commander.
- ⑨ 7 BAND SPECTRUM ANALYZER display**
This is a 7-division real time analyzer, and the frequency band is the same as that of the graphic equalizer.
- ⑩ VOL LEVEL (volume level) indicator**
Indicates the output level of the amplifier.
- ⑪ MUTING button**
Press to reduce the sound level by 20 dB. Press again to restore the same listening level as before. This function is useful when you lower the tonearm onto a record or when you answer the telephone.
- ⑫ Muting indicator**
Lights when the MUTING button is pressed.
- ⑬ VOLUME control**
Press the "+" side to increase the overall sound level, or the "-" side to decrease it.
- ⑭ Function indicators**
The indicator lights to show the audio input source in use. When the power is turned on, the tuner indicator lights.
- ⑮ POWER switch**
Depress (Δ ON) to turn on the power of the stereo system. To turn it off, press again (\square OFF).
- ⑯ AMFB (Accurate Motional Feedback) switch and indicator**
Depress when reinforcing bass sounds. The indicator lights up. This function will not work unless both the right and left speakers are connected. Also, this function will not work in case you are listening with headphones. Then, the indicator will go out.
- ⑰ HEADPHONES jack (stereo phone jack)**
- ⑱ GRAPHIC EQUALIZER controls**
Slide each control upwards to increase the level of the frequency band, and downwards to decrease the level.
63 Hz: Use to boost or cut heavy bass.
150 Hz: Use to boost or cut normal bass.
400 Hz: Use to adjust the power, spaciousness and warmth of the sound.
1 kHz: Use to provide more presence for vocals.
3 kHz: Use to boost a brighter sound and to reduce stridency.
6 kHz: Use to adjust the brightness of sound.
14 kHz: Use to adjust the treble.

To record or listen to the sound with the original tone quality, set all the controls at their center positions.

[19] FUNCTION select buttons

Select the desired button for program source.

TAPE: For listening to a taped program.

CD/AUX: For listening to or record a compact disc or auxiliary program source connected to CD/AUX inputs.

TUNER: For listening to or record a radio program.

PHONO: For listening to or record a record program source connected to PHONO inputs.

To select a tuner program, press any button of the tuner except MEMORY and STEREO MUTING buttons.

To select a taped program, set the cassette deck in playback mode.

[20] BALANCE control

Adjusts the balance of the left and right channel output levels.

[21] MIC LEVEL (microphone level) control

Controls the input level of the microphone.

Slide towards MAX to increase microphone level and towards MIN to decrease it.

When not in use of microphone mixing, set this control to the MIN position.

[22] MIC (microphone) jack (phone jack)

Connect a microphone for microphone mixing.

TC-177R cassette deck**[23] TAPE COUNTER and reset button**

The tape counter provides a numerical reference point. To reset to zero, press the reset button.

[24] DOLBY NR switch

Select the Dolby NR* (Noise Reduction) system to be used for recording or playback.

OFF: To record or play back without the Dolby NR process.

B: To record or play back with the Dolby B-type NR process.

C: To record or play back with the Dolby C-type NR process.

*Dolby and the double -D symbol are trade marks of the Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

[25] DIRECTION MODE selector

Select the mode of tape transport for recording and playback.

→ : To record or play back one side of a cassette.

↔ : To record on both sides of a cassette or to repeat playback of both sides endlessly.

[26] TIMER standby switch

Normally set to OFF. To start recording or playback automatically using an optional timer, set to REC or PLAY.

[27] ▲ EJECT (eject) button

Press to open the cassette holder.

[28] Tape transport direction mode indicators**[29] Tape operation mode select buttons**

◀ (fast reverse)/AUTO PLAY ▶ button

AMS (Automatic Music Sensor) button and indicator:

Press to activate the AMS function. The indicator lights.

To deactivate that function, press again.

◀ (reverse play) button

■ (stop) button ▶ (play) button

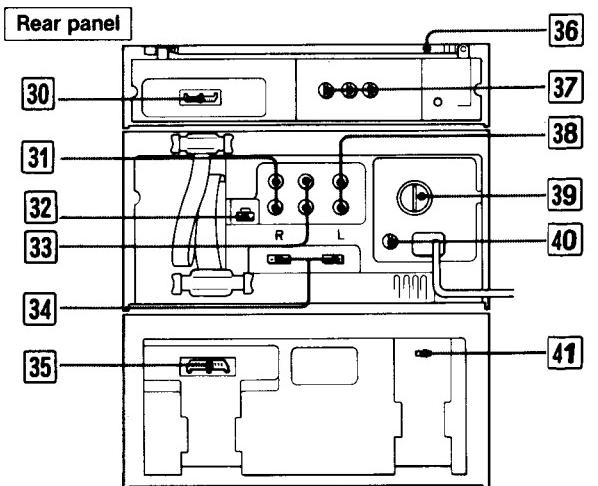
▶ (fast forward)/AUTO PLAY □ button

II PAUSE button and indicator: Press to stop the tape

momentarily during recording or playback. To disengage pause mode, press again. The indicator lights during pause and flickers just after the power is turned on and during record muting.

○ (record muting) button: Press to eliminate unwanted program material such as broadcasting commercials during recording.

● REC (record) button and indicator: To start recording keeping this button pressed, press the □ or ▶ buttons



30 Power connector of tuner

31 PHONO inputs (phono jacks)

Accepts the outputs of a turntable system.

32 CONTROL S OUT connector (4-pin)

Connect the supplied CD player connecting cord to this connector to control the compact disc player from a remote location.

33 CD/AUX (compact disc/auxiliary) inputs (phono jacks)

Accepts the outputs of a compact disc player or input sources such as a playback only tape deck.

34 Speaker terminals

35 Power connector of tape deck

36 Telescopic antenna

Used for FM or SW (only for E, EA3 models) reception.

37 FM/LW/MW external antenna terminals (AEP, AED, JK models)
FM/SW/MW external antenna terminals (E, EA3 models)

38 PRE OUT outputs (phono jacks)

Accepts the line inputs of a tape deck for tape recording. Recording the sound adjusted with the GRAPHIC EQUALIZER controls or the microphone sound mixed with sources can be made.

39 VOLTAGE SELECTOR (only for E, EA3 models)

40 Ground terminal (only for West Germany and Italy)

41 ISS (interference suppress switch)

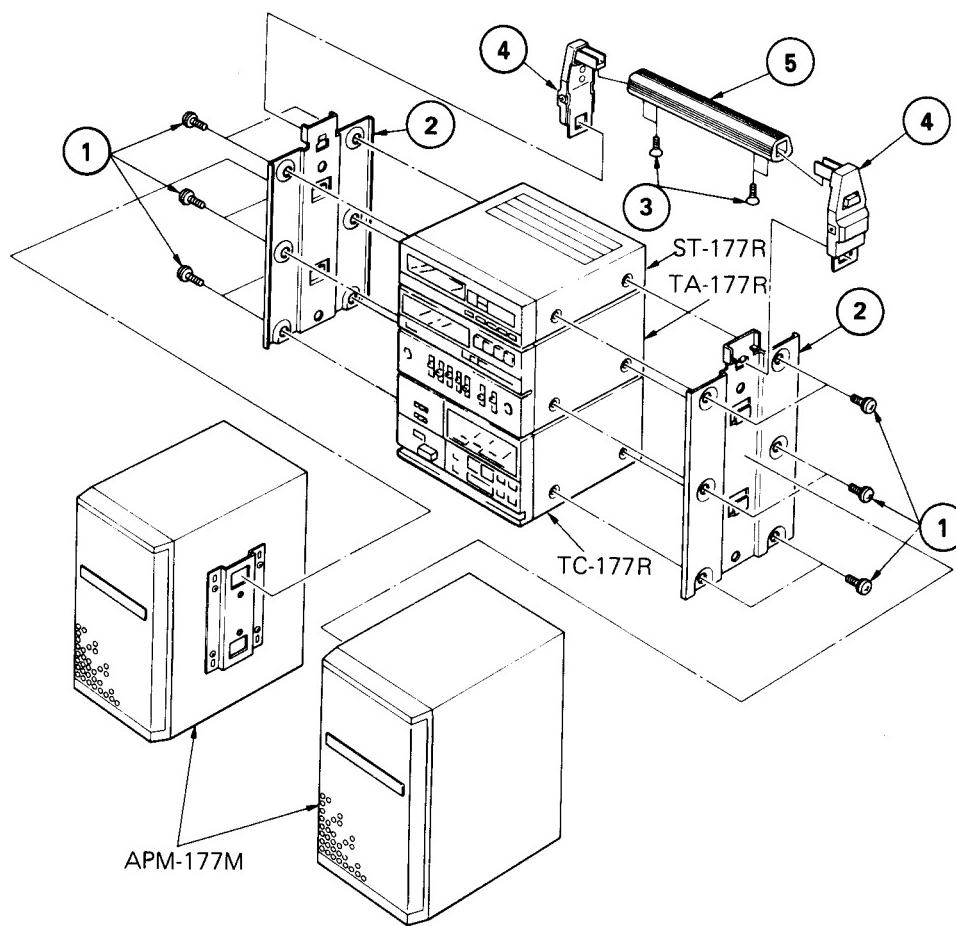
If interference is encountered while recording MW or LW program, slide the switch to position 1, 2 or 3 depending on which best reduces the noise.

EXPLODED VIEW AND PARTS LIST

NOTE:

The mechanical parts with no reference number in the exploded views are not supplied.

Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

GENERAL SECTION

No.	Part No.	Description
1	X-4902-909-1	SCREW ASSY, SIDE PLATE
2	4-910-051-11	PLATE (C), SIDE
3	7-685-247-29	SCREW +KTP 3X10 TYPE2 SLIT
4	X-4910-069-1	BRACKET ASSY, HANDLE
5	2-249-402-01	HANDLE

ACCESSORY & PACKING MATERIAL

Part No.	Description
1-463-732-11	REMOTE COMMANDER (RM-177R)
1-556-372-61	CORD, CONNECTION (4 CORE)
3-701-630-00	BAG, POLYETHYLENE
3-765-098-11	(EXCEPT FOR G-AEP)...MANUAL, INSTRUCTION
3-765-098-41	(AEP,G-AEP,Denmark)...MANUAL, INSTRUCTION
*4-603-394-00	CUSHION (A)(RM-177R)
4-884-945-00	PARTITION

ACCESSORY & PACKING MATERIAL

Part No.	Description
4-872-911-00	(TC-177R)...SHEET, PROTECTION
4-872-911-00	(TA-177R)...SHEET, PROTECTION
4-884-884-00	(ST-177R)...SHEET, PROTECTION
4-910-323-01	(APM-177M)...SHEET, PROTECTION
4-907-610-01	JOINT
4-910-052-01	CUSHION (FRONT), UPPER
4-910-053-01	CUSHION (REAR), UPPER
4-910-054-01	CUSHION (FRONT), LOWER
4-910-055-01	CUSHION (REAR), LOWER
4-910-353-01	(APM-177M)...CUSHION, UPPER
4-910-324-01	(APM-177M)...CUSHION, LOWER
4-914-346-21	(E2/3,Saudi Arabia).....INDIVIDUAL CARTON
4-914-346-31	(AEP,G-AEP,UK,Denmark)...INDIVIDUAL CARTON
9-911-842-XX	CUSHION (F)
X-4902-908-1	BAG ASSY, SCREW

FM STEREO/FM-AM TUNER (ST-177R)

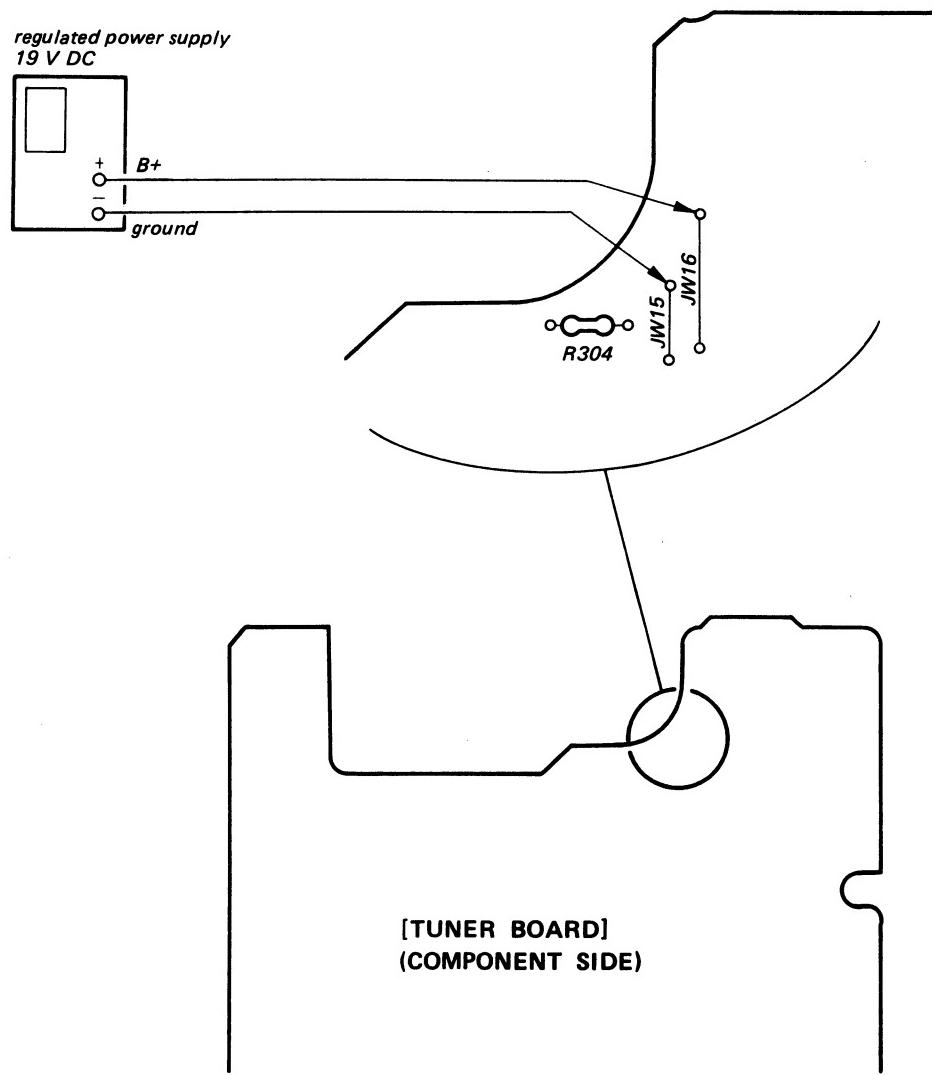
(AEP, UK model)

REPAIRING PRECAUTION

[To apply B+ voltage]

The power of this unit is fed from TA-177R.

Because of this, connect the regulated power supply as illustrated below when this unit alone operates.

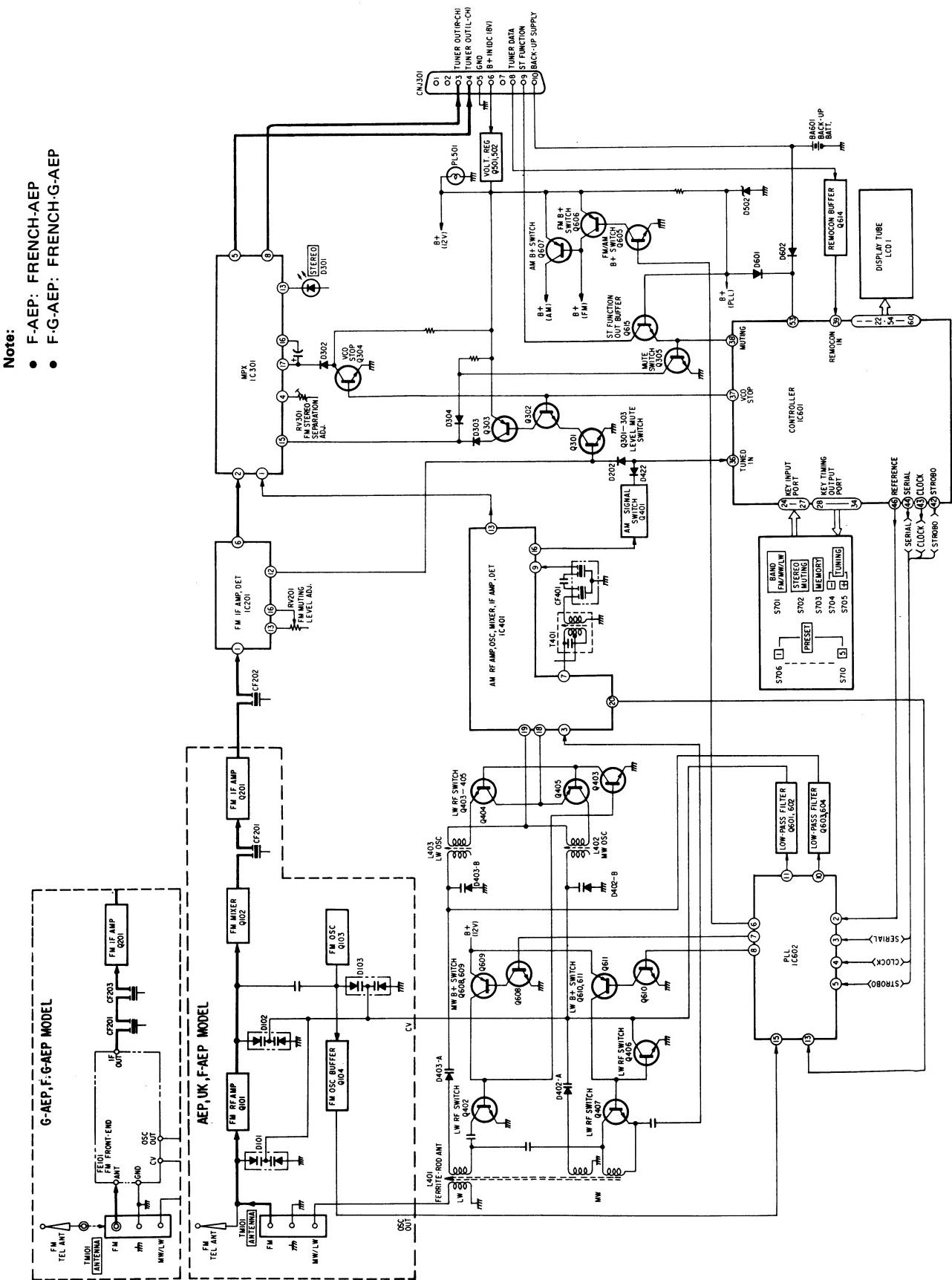


FH-150R
ST-177R

(AEP, UK model)

SECTION 1

BLOCK DIAGRAM



SECTION 2
ADJUSTMENTS

(AEP, UK model)

FH-150R
ST-177R

FH-150R
ST-177R

(AEP, UK model)

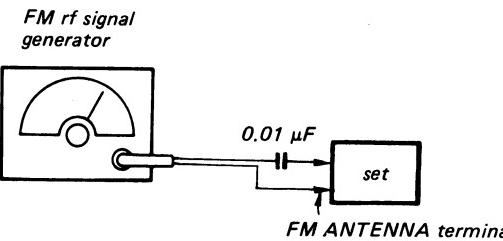
FM SECTION 1

Setting:

BAND selector switch . . . FM

FM OSC Voltage Adjustment

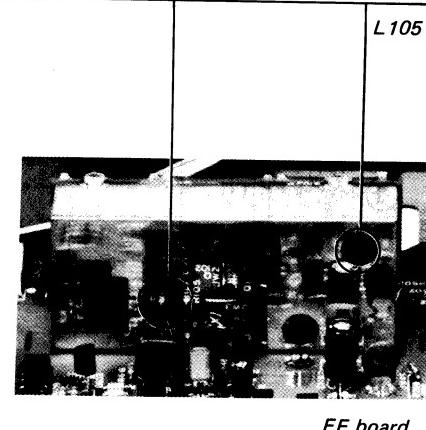
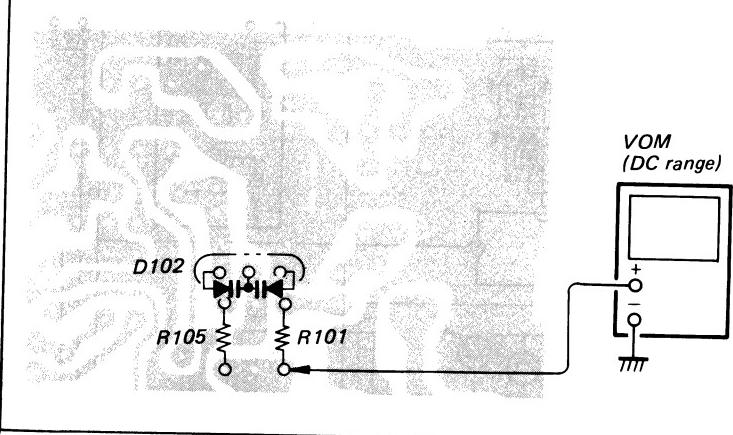
Setting:



Procedure:

- Push the TUNING (+, -) button for 108 MHz.
- Adjust L105 for 8.9 – 9 V reading on the VOM.

[FE BOARD] (CONDUCTOR SIDE)



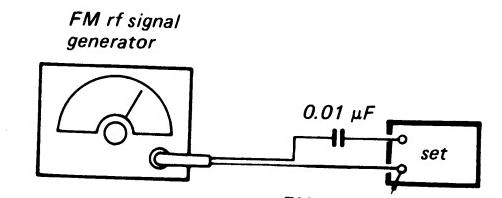
FE board

G-AEP, F-G-AEP Model:

The FM front-end is carefully adjusted at the factory and is supplied as one whole block for replacement.

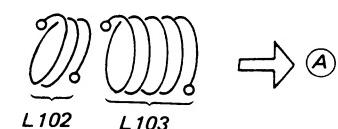
**FM Tracking Adjustment
(Except for G-AEP, F-G-AEP model)**

Setting:

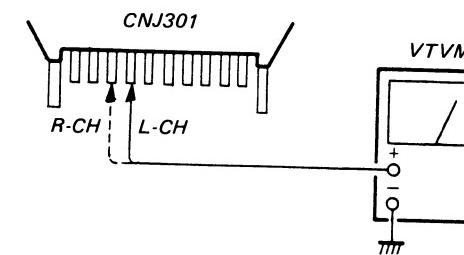
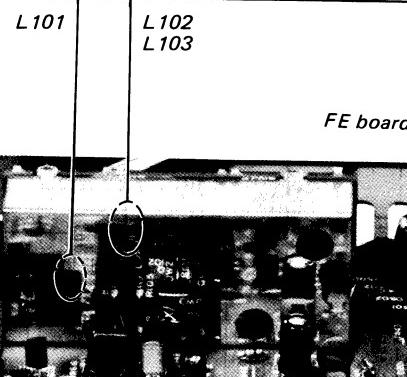


Procedure:

- Push TUNING (+, -) button for 98 MHz.
- Approach L102 and L103 not to contact each other.
- Adjust L101 and L103, and repeat the adjustment 2 – 3 times for maximum VTVM reading.
(Adjust L103 in the direction as shown by arrow A.)



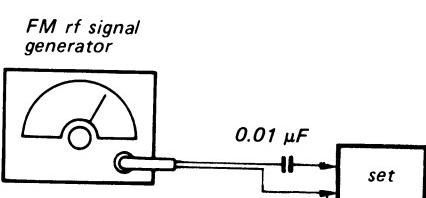
Note: Do not touch L102.
• F-G-AEP: FRENCH-G-AEP



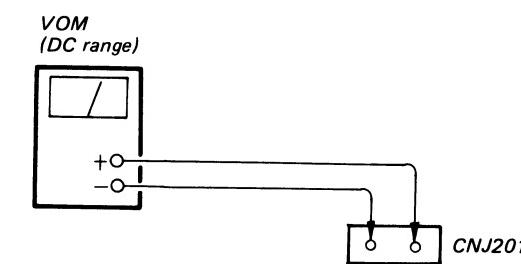
Note: FM discriminator alignment should be made after FM tracking adjustment.

FM Discriminator Alignment (NULL Check)

Setting:



Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation (AEP, UK, F-AEP model)
1 kHz, 40 kHz deviation (G-AEP, F-G-AEP model)
Output level: 1 mV (60 dB)

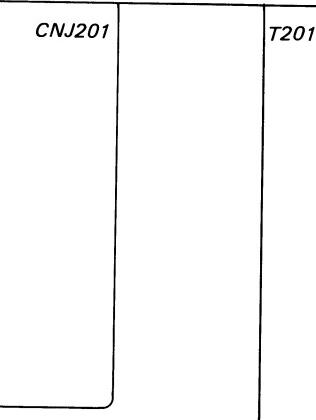
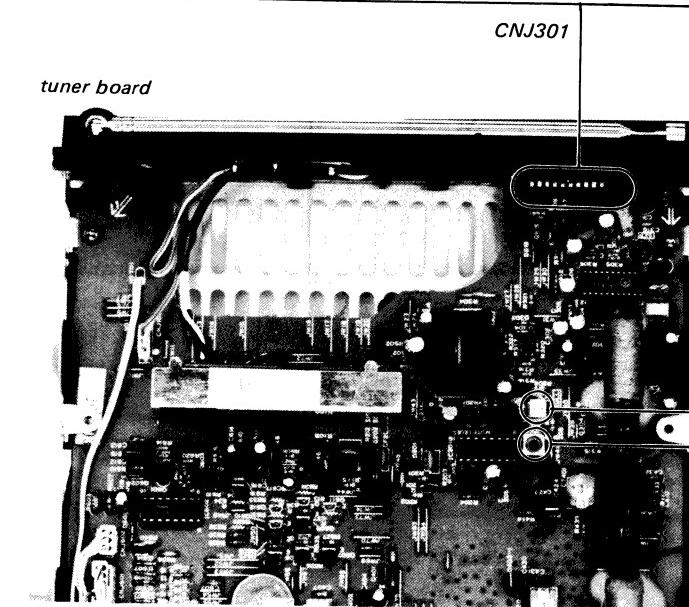


Procedure:

- Push the TUNING (+, -) button for 98 MHz.
- Adjust T201 for 0 V reading on the VOM.

Note:

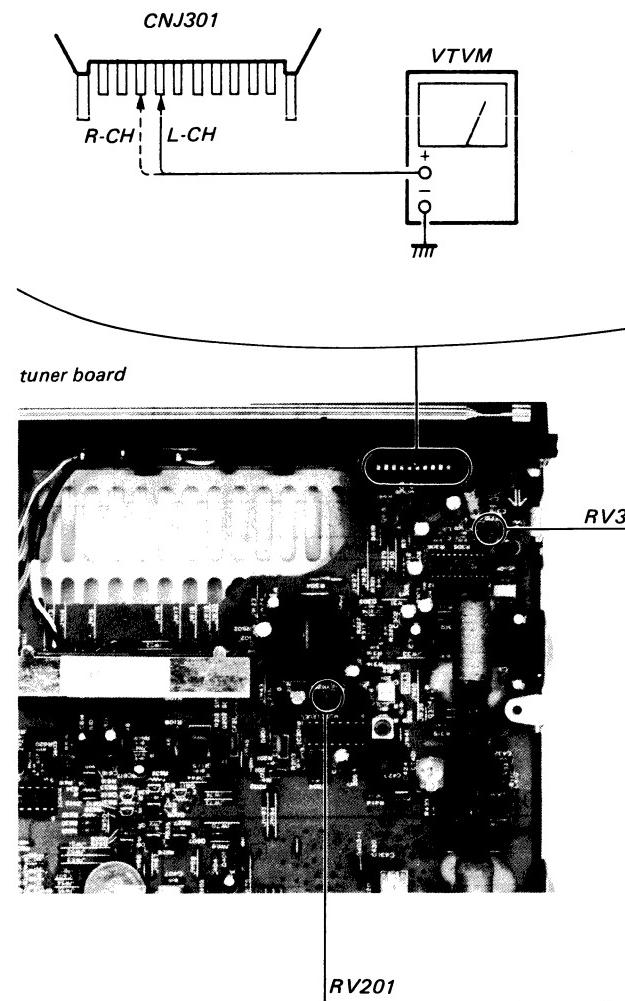
- F-AEP: FRENCH-AEP
- F-G-AEP: FRENCH-G-AEP



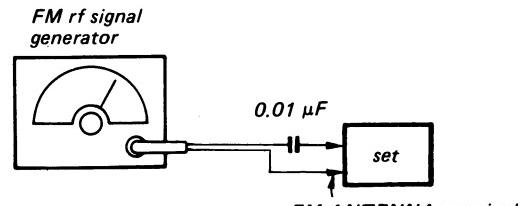
(AEP, UK model)

**FH-150R
ST-177R****FH-150R
ST-177R**

(AEP, UK model)

FM SECTION 2**FM Muting Level Adjustment**

Setting:
STEREO MUTING switch . . . ON

Procedure:

Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation (AEP, UK, F-AEP model)
1 kHz, 40 kHz deviation (G-AEP, F-G-AEP model)
Output level: 17.9 μ V (25 dB)

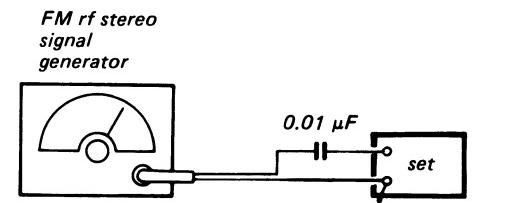
- Push the TUNING (+, -) button for 98 MHz.
- Adjust RV201 for a point the VTVM reading just drops to 0 V.

Note:

- F-AEP: FRENCH-AEP
- F-G-AEP: FRENCH-G-AEP

FM Stereo Separation Adjustment

Setting:
STEREO MUTING switch . . . ON

Procedure:

Carrier frequency: 98 MHz
Modulation: 33.75 kHz deviation (AEP, UK, F-AEP model)
20 kHz deviation (G-AEP, F-G-AEP model)
pilot (19 kHz); 7.5 kHz deviation
sub-channel (38 kHz); 33.75 kHz deviation (AEP, UK, F-AEP model)
20 kHz deviation (G-AEP, F-G-AEP model)

Output level:
Mode: 1 mV (60 dB) stereo

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	(A)
R-CH	L-CH	Adjust RT301 for minimum reading.
R-CH	R-CH	(C)
L-CH	R-CH	(D)
		Adjust RT301 for minimum reading.

L-CH Stereo separation: (A) – (B)

R-CH Stereo separation: (C) – (D)

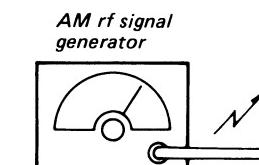
The separations of both channels should be equal.

Note:

- F-AEP: FRENCH-AEP
- F-G-AEP: FRENCH-G-AEP

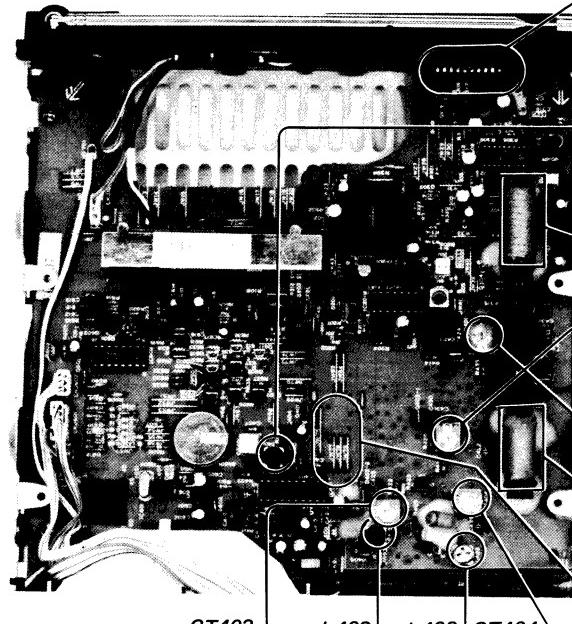
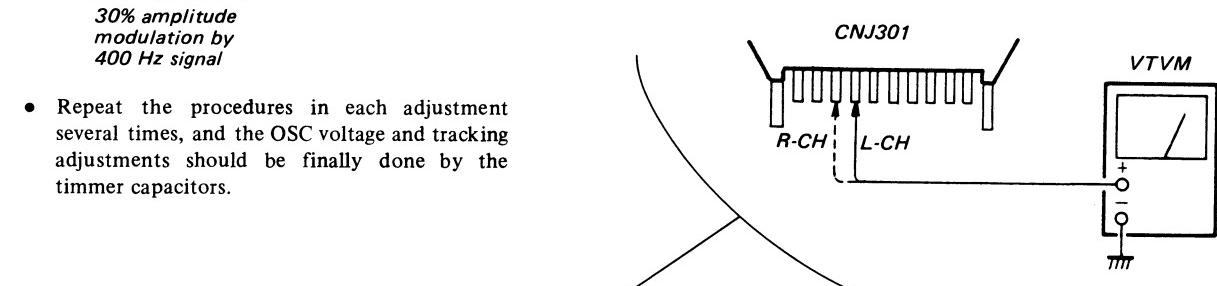
AM SECTION**Setting:**

BAND selector switch: MW or LW



30% amplitude modulation by 400 Hz signal

- Repeat the procedures in each adjustment several times, and the OSC voltage and tracking adjustments should be finally done by the timer capacitors.



AM IF ALIGNMENT	
Adjust for a maximum reading on VTVM.	T401 450 kHz

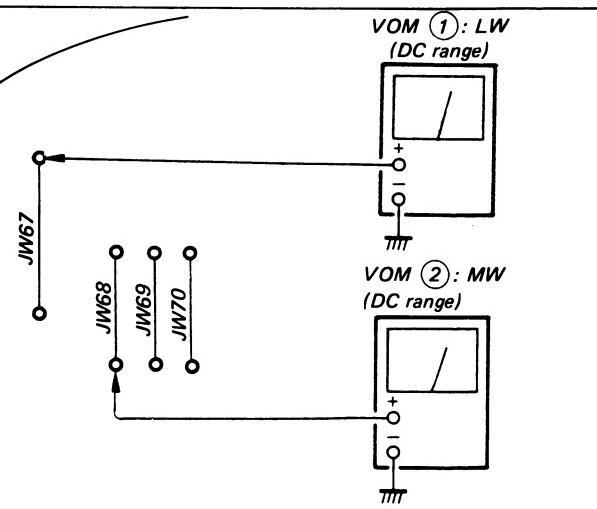
LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	L401 170 kHz
	CT403 310 kHz

Note: MW tracking adjustment should be made after LW tracking adjustment.

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	CT401 1,404 kHz
	L401 603 kHz

MW/LW OSC Voltage Adjustment**Procedure:**

- Set BAND selector switch to MW.
- Push TUNING (+, -) button for 531 kHz. Adjust L402 for 0.95 – 1.05 V VOM ② reading.
- Push the button for 1,602 kHz. Adjust CT402 for 8.9 – 9.0 V VOM ② reading.
- Set BAND selector switch to LW.
- Push TUNING (+, -) button for 153 kHz. Adjust L403 for 0.95 – 1.05 V VOM ① reading.
- Push the button for 344 kHz. Adjust CT404 for 8.9 – 9.0 V VOM ① reading.



3-1. MOUNTING DIAGRAM

—Conductor Side—

1

2

SECTION 3
DIAGRAMS

(AEP, UK model)

FH-150R
ST-177RFH-150R
ST-177R

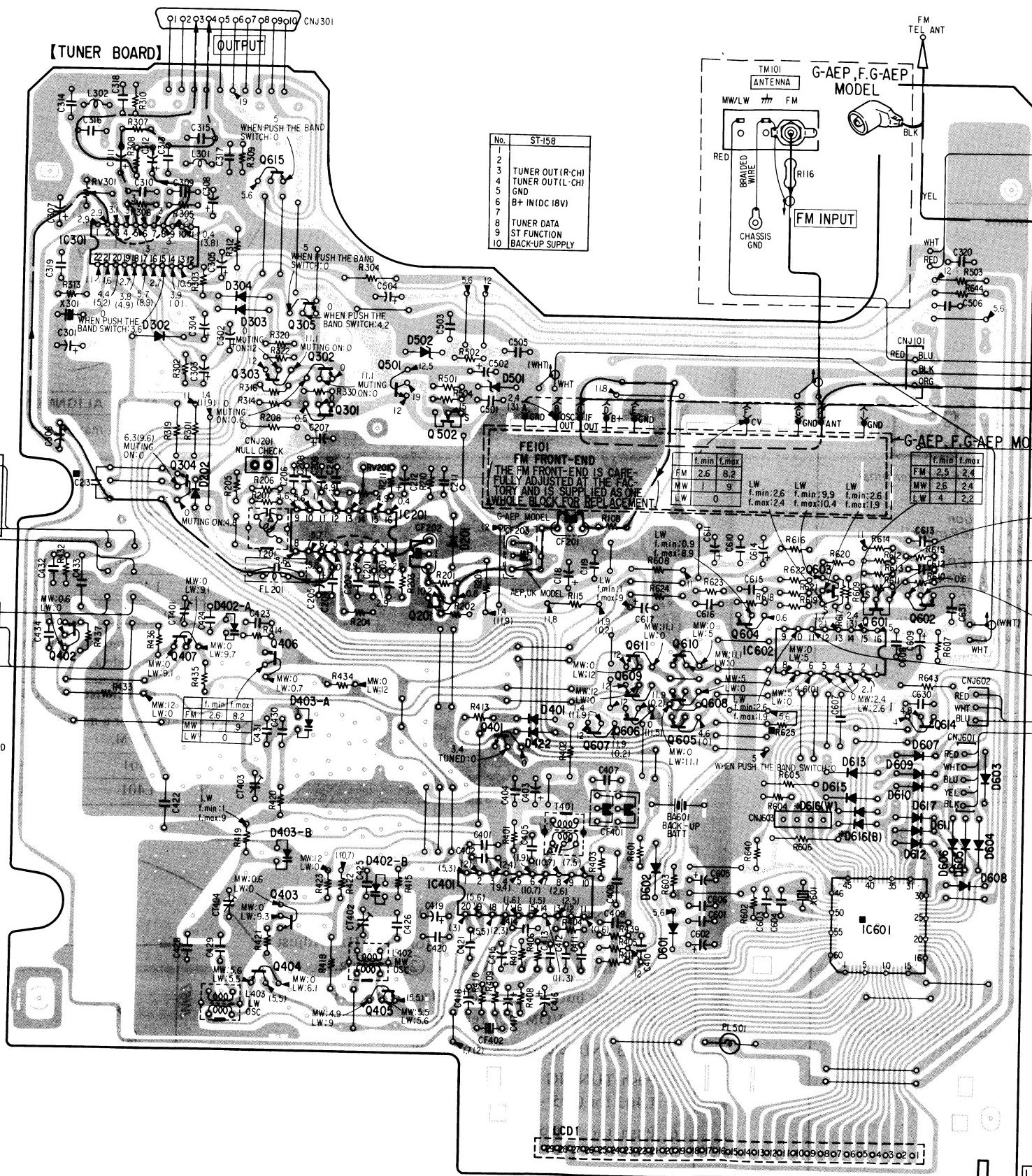
(AEP, UK model)

15

- Refer to page ST-12 for Semiconductor Lead Layouts.

A

	Q, IC	D
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		



10

11

12

13

14

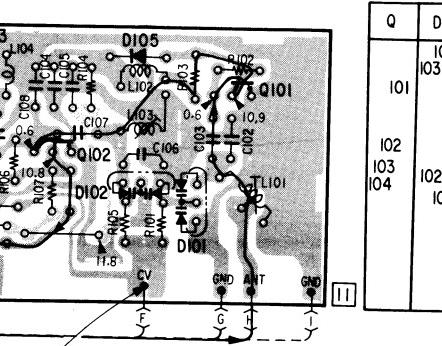
15

[LED BOARD]

AEP, UK, F-AEP MODEL

[FE BOARD]

[TACT BOARD]



f.min f.max

FM 2.6 8.2

MW 1 9

LW 0

f.min f.max

FM 2.1 2

MW 2.2 1.9

LW 0

f.min f.max

FM 10 10.2

MW 10 10.3

LW 8.9 10.3

f.min f.max

FM 2.6 8.2

MW 1 9

LW 7.5

f.min f.max

FM 2.2 2

MW

LW 0

Note:

- Color code of sleeving over the end of the jacket.

• : indicates side identified with part number.

• : signal path

• : L-CH signal path

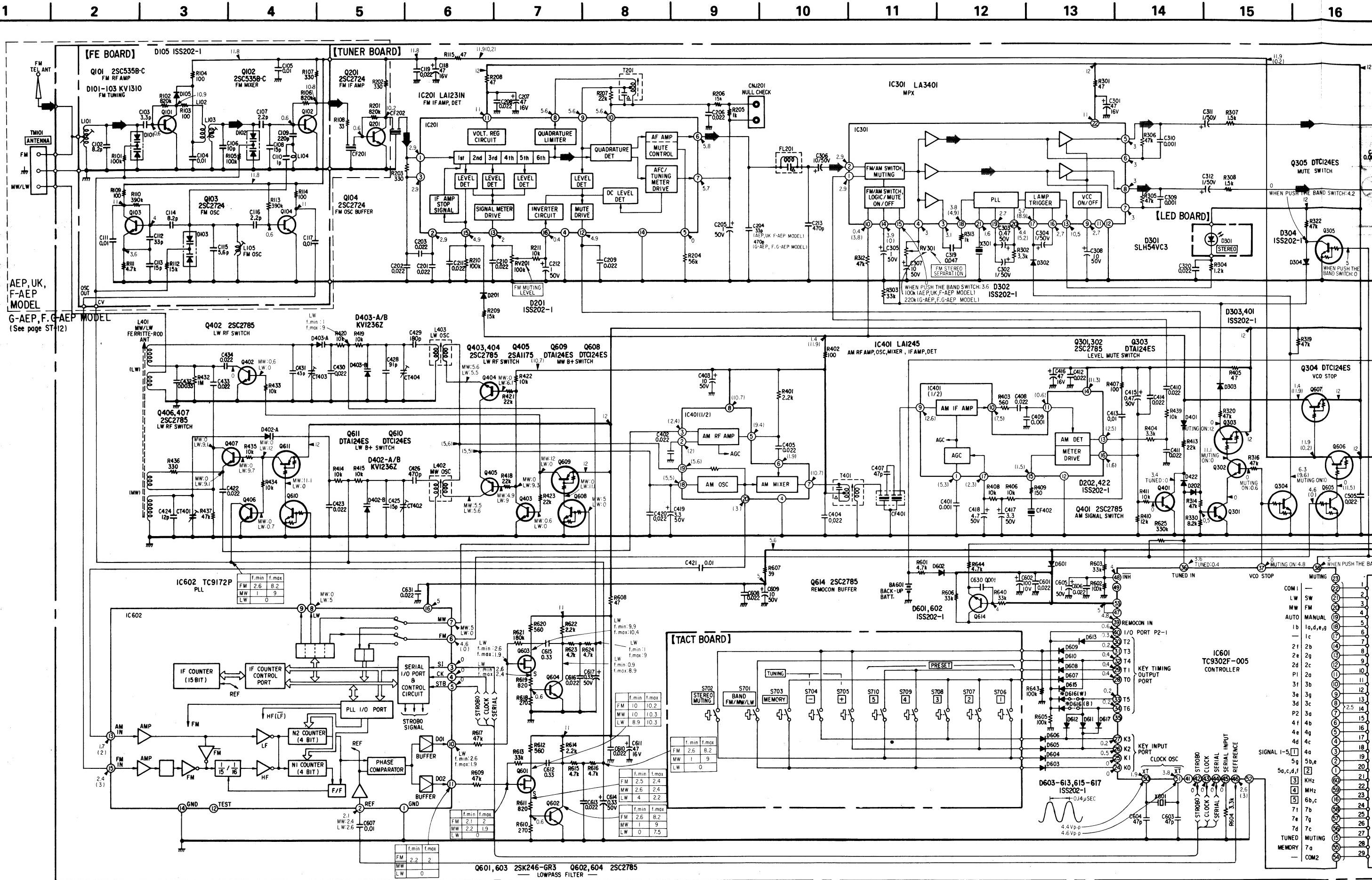
• : R-CH signal path

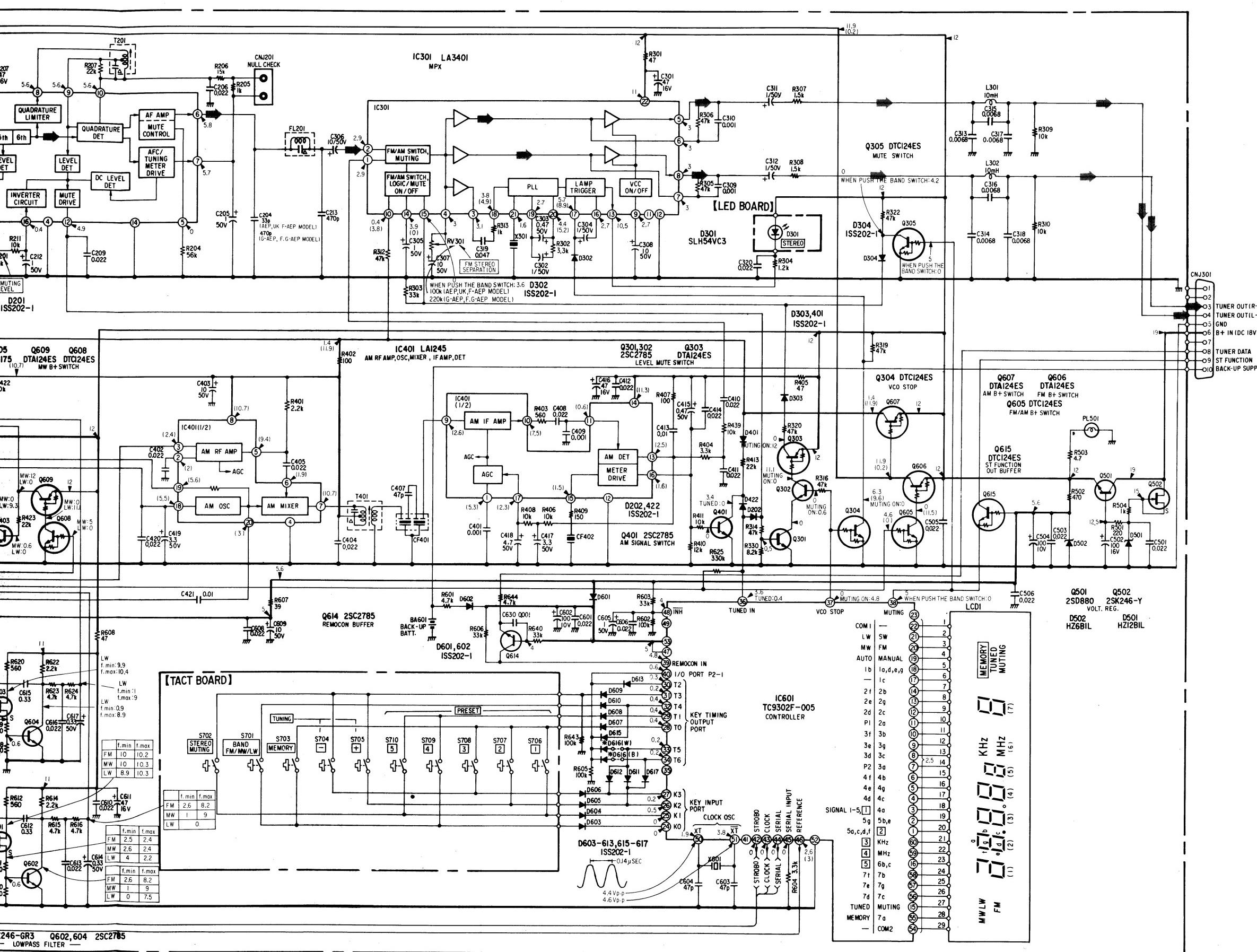
• : B+ pattern

• : F-AEP: FRENCH-AEP

• : F-G-AEP: FRENCH-G-AEP

3-2. SCHEMATIC DIAGRAM





Note:

- All capacitors are in μF unless otherwise noted. pF: $\mu\mu\text{F}$
50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{2}\text{W}$ or less unless otherwise specified.
 - : signal path.
 - Δ : internal component.
 - : B+ bus.
 - [] : adjustment for repair.
 - Voltages are dc with respect to ground unless otherwise noted.
 - Readings are taken under detuned conditions with a VOM (50 k Ω /V).
 - no mark: FM
(): AM
 - Voltage variations may be noted due to normal production tolerances.
 - Waveforms are taken to ground in detuned mode by using oscilloscope. Voltage variations may be noted due to normal production tolerances.
 - F-AEP: FRENCH-AEP
 - F-G-AFP: FRENCH-G-AFP

* : When replacing ceramic filters CF201, 202 and CF203 (G-AEP model), color marking on their bodies should be the same.

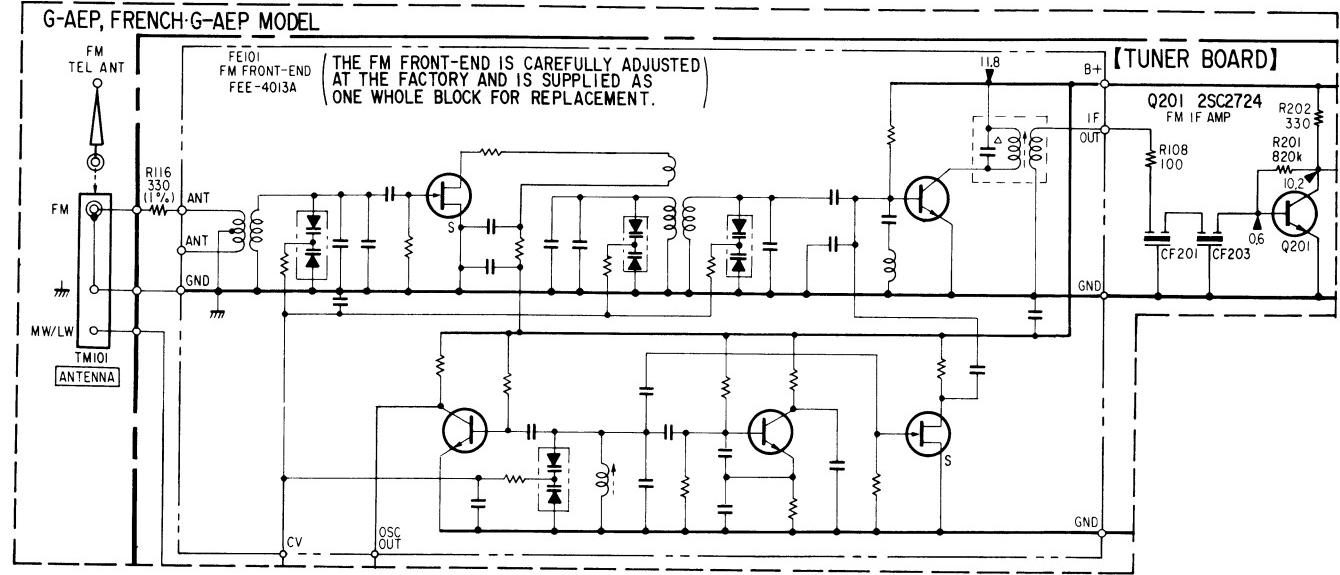
Connect or remove D616 according to color marking of ceramic filters.

color marking

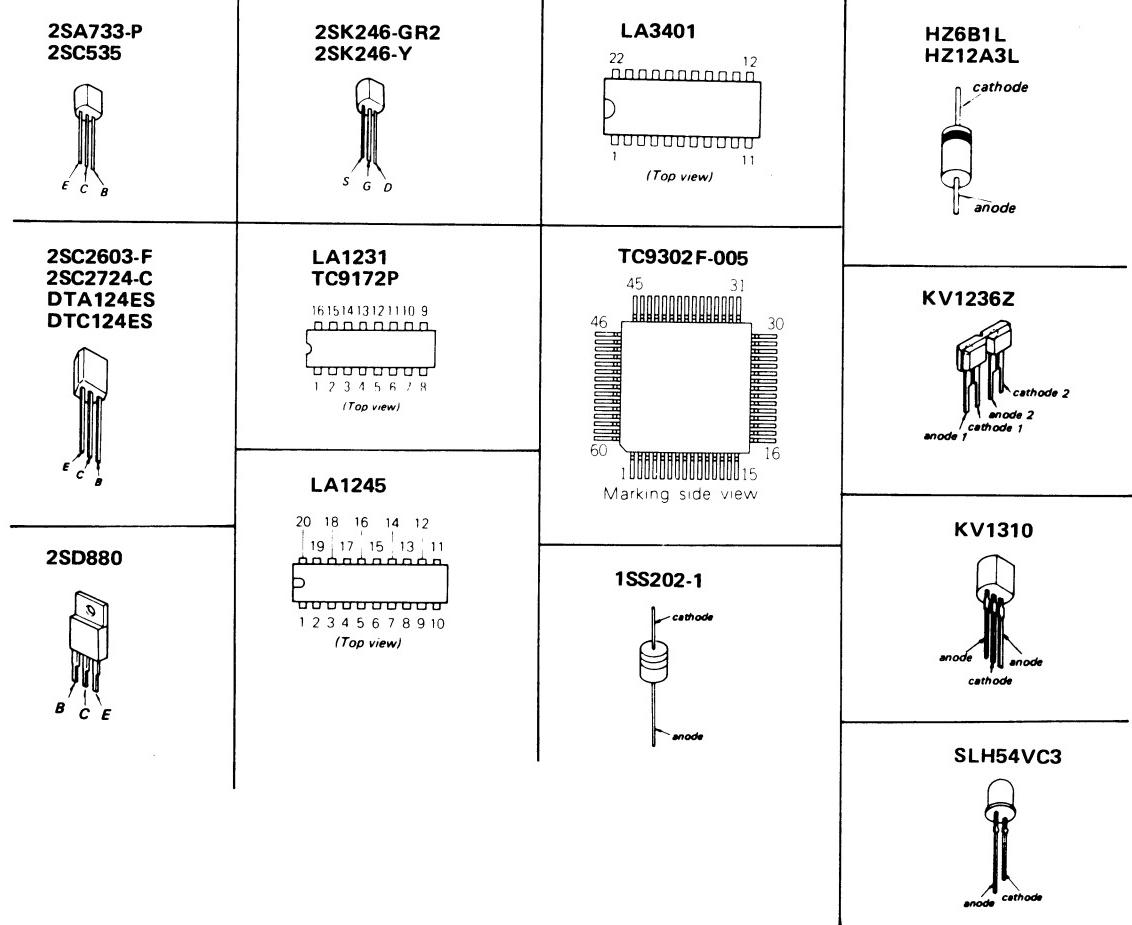
COLOR MARKING

<i>color marking</i>	CF201 – 203	D616
	color marking	
black		D616 (B), connected
red		not connected
white		D616 (W), connected

3-3. FM FRONT-END SCHEMATIC DIAGRAM (G-AEP, FRENCH-G-AEP MODEL)



● Semiconductor Lead Layouts



EXPLODED VIEWS AND PARTS LIST

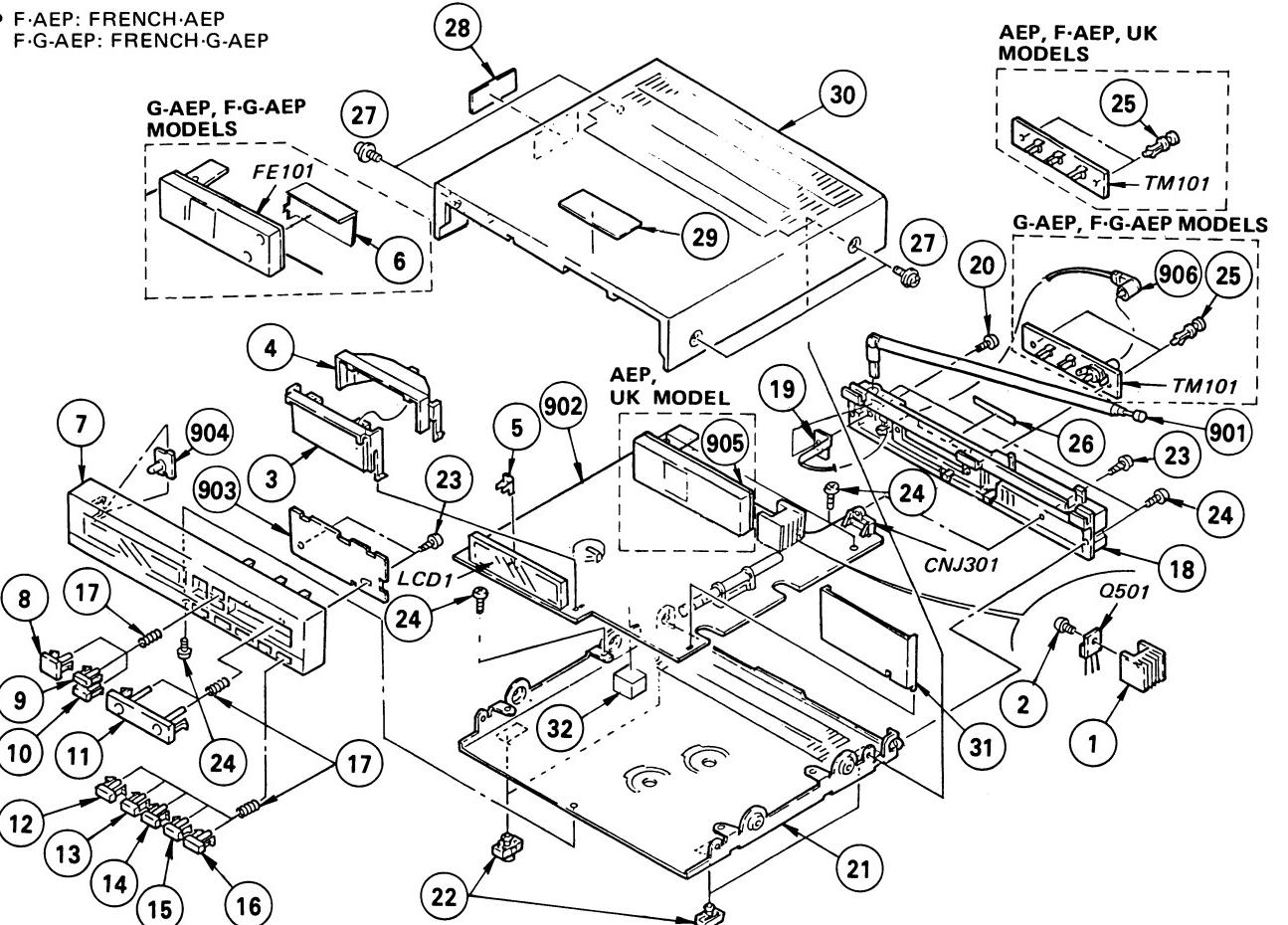
NOTE:

The mechanical parts with no reference number in the exploded views are not supplied.

The construction parts of an assembled part are indicated with a collation number in the remark column.

• Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- F-AEP: FRENCH-AEP
- F-G-AEP: FRENCH-G-AEP



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	*4-363-146-21	HEAT SINK, V.OUT		26	*4-910-084-01	(AEP,F-G-AEP,UK)...LABEL, ANTENNA	C201
2	7-685-646-81	SCREW +BVTP 3X8	TYPE2	27	4-910-085-01	(G-AEP,F-G-AEP)...LABEL, ANTENNA	C202
3	*4-909-633-01	ILLUMINATOR		28	4-886-821-21	SCREW, M3 CASE STOPPER	C203
4	*4-904-515-01	HOUSE, LAMP		29	4-914-318-01	(AEP,UK)...LABEL, MODEL NUMBER	C204
5	*4-904-507-01	BLIND, LAMP		30	*4-914-313-01	(F-AEP,F-G-AEP)...LABEL, MODEL NUMBER	C204
6	*4-910-359-01	PLATE, SHIELD		31	*4-914-365-01	(G-AEP)...LABEL, MODEL NUMBER	C204
7	X-4910-084-1	PANEL ASSY, FRONT		32	4-884-927-00	LABEL (SYSTEM), CAUTION	C205
8	4-910-093-11	BUTTON, SQUARE (BAND)		33	X-4902-904-1	CASE ASSY	C206
9	4-910-087-01	BUTTON (B), SQUARE (STEREO MUTING)		34	*4-910-090-01	PLATE, SHIELD	C207
10	4-910-087-71	BUTTON (B), SQUARE (MEMORY)		35	9-911-842-XX	CUSHION (F)	C208
11	4-910-094-11	BUTTON, SQUARE (TUNING)		36	1-501-321-11	ANTENNA, TELESCOPIC	C209
12	4-914-314-01	BUTTON, SQUARE (PRESET 1)		37	*A-4351-529-A	(AEP,F-AEP,UK)...MOUNTED PCB, TUNER	C210
13	4-914-314-11	BUTTON, SQUARE (PRESET 2)		38	*A-4351-530-A	(G-AEP,F-G-AEP)...MOUNTED PCB, TUNER	C211
14	4-914-314-21	BUTTON, SQUARE (PRESET 3)		39	*1-615-524-11	PC BOARD, TACT	C212
15	4-914-314-31	BUTTON, SQUARE (PRESET 4)		40	*1-615-525-11	PC BOARD, LED	C301
16	4-914-314-41	BUTTON, SQUARE (PRESET 5)		41	*1-615-526-11	(AEP,F-AEP,UK)...PC BOARD, F.E	C302
17	4-886-032-00	SPRING, COMPRESSION		42	*1-562-908-11	(G-AEP,F-G-AEP)...CONNECTOR, FEMALE	C303
18	4-910-098-01	PLATE, JACK		43	CNJ301 1-562-479-12	SOCKET, CONNECTOR 10P	C304
19	*4-910-081-01	TERMINAL BOARD, ROD ANTENNA		44	FE101 1-463-611-11	(G-AEP,F-G-AEP)...FRONT END, FM	C305
20	7-682-548-09	SCREW +B 3X8		45	(FEE-4013A)		
21	*4-902-941-21	CHASSIS		46	LCD1 1-806-874-11	INDICATOR, L-CRYSTAL LT5056	
22	X-4902-937-1	FOOT ASSY, RUBBER		47	0501 8-729-288-02	TRANSISTOR 2SD880	
23	7-685-646-71	SCREW +BVTP 3X8	TYPE2 N-S	48	TM101 1-536-733-00	(G-AEP,F-G-AEP)...TERMINAL BOARD,	
24	7-685-871-01	SCREW +BVTT 3X6 (S)		49		ANTENNA	
25	4-829-039-00	RIVET, NYLON		50	TM101 1-536-901-11	(AEP,F-AEP,UK)...TERMINAL BOARD 3P,	
						ANTENNA	

NOTE:
Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

If there are sets such as typical capacity circuit

• F-AEP
• F-G-AEP

Ref.No. Part No. 1-5
901 *A-4-
902 *A-4-
903 *1-6-
904 *1-6-
905 *1-6-
906 *1-5-
BA601 1-5-
C102 1-1-
C103 1-1-
C104 1-1-
C105 1-1-
C106 1-1-
C107 1-1-
C108 1-1-
C109 1-1-
C110 1-1-
C111 1-1-
C112 1-1-
C113 1-1-
C114 1-1-
C115 1-1-
C116 1-1-
C117 1-1-
C118 1-1-
C119 1-1-
C201 1-10-
C202 1-10-
C203 1-10-
C204 1-16-
C205 1-12-
C206 1-10-
C207 1-12-
C208 1-10-
C209 1-10-
C210 1-10-
C211 1-10-
C212 1-12-
C301 1-12-
C302 1-12-
C303 1-12-
C304 1-12-
C305 1-12-

SECTION 4 (AEP, UK model)

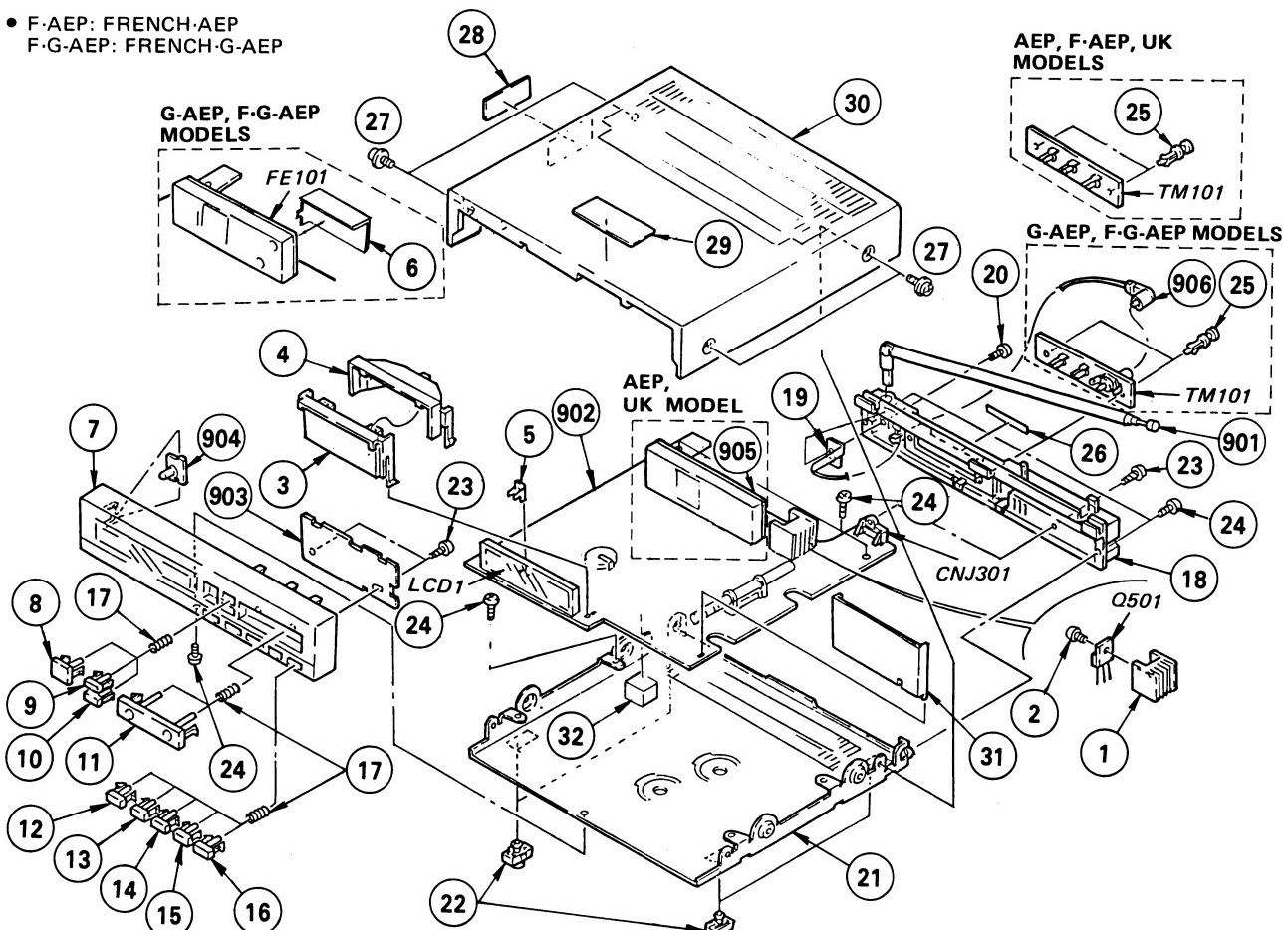
EXPLODED VIEWS AND PARTS LIST

NOTE:

The mechanical parts with no reference number in the exploded views are not supplied.

Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- F-AEP: FRENCH-AEP
F-G-AEP: FRENCH-G-AEP



No.	Part No.	Description	Remarks
1	*4-363-146-21	HEAT SINK, V.OUT	
2	7-685-646-81	SCREW +BVTT 3X8	TYPE2
3	*4-909-633-01	ILLUMINATOR	
4	*4-904-515-01	HOUSE, LAMP	
5	*4-904-507-01	BLIND, LAMP	
6	*4-910-359-01	PLATE, SHIELD	
7	X-4910-084-1	PANEL ASSY, FRONT	
8	4-910-093-11	BUTTON, SQUARE (BAND)	
9	4-910-087-01	BUTTON (B), SQUARE (STEREO MUTING)	
10	4-910-087-71	BUTTON (B), SQUARE (MEMORY)	
11	4-910-094-11	BUTTON, SQUARE (TUNING)	
12	4-914-314-01	BUTTON, SQUARE (PRESET 1)	
13	4-914-314-11	BUTTON, SQUARE (PRESET 2)	
14	4-914-314-21	BUTTON, SQUARE (PRESET 3)	
15	4-914-314-31	BUTTON, SQUARE (PRESET 4)	
16	4-914-314-41	BUTTON, SQUARE (PRESET 5)	
17	4-886-032-00	SPRING, COMPRESSION	
18	4-910-098-01	PLATE, JACK	
19	*4-910-081-01	TERMINAL BOARD, ROD ANTENNA	
20	7-682-548-09	SCREW +B 3X8	
21	*4-902-941-21	CHASSIS	
22	X-4902-937-1	FOOT ASSY, RUBBER	
23	7-685-646-71	SCREW +BVTP 3X8	TYPE2 N-S
24	7-685-871-01	SCREW +BVTT 3X6 (S)	
25	4-829-039-00	RIVET, NYLON	

FH-150R
ST-177R

FH-150R
ST-177R

(AEP, UK model)

SECTION 5
ELECTRICAL PARTS LIST

NOTE:

Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

- F-AEP: FRENCH-AEP
F-G-AEP: FRENCH-G-AEP

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Remarks
901	1-501-321-11	ANTENNA, TELESCOPIC	
902	*A-4351-529-A *A-4351-439-A	(AEP,F-AEP,UK)...MOUNTED PCB, TUNER (G-AEP,F-G-AEP)...MOUNTED PCB, TUNER	
903	*1-615-524-11	PC BOARD, TACT	
904	*1-615-525-11	PC BOARD, LED	
905	*1-615-526-11	(AEP,F-AEP,UK)...PC BOARD, F.E	
906	*1-562-908-11	(G-AEP,F-G-AEP)...CONNECTOR, FEMALE (NO SHIELD)	
BA601	1-528-120-00	BATTERY, LITHIUM (CR-2025)	
C102	1-162-198-31	(AEP,F-AEP,UK)...CERAMIC 8.2PF	10% 50V
C103	1-162-193-31	(AEP,F-AEP,UK)...CERAMIC 3.3PF	10% 50V
C104	1-162-306-31	(AEP,F-AEP,UK)...CERAMIC 0.01MF	20% 16V
C105	1-162-306-31	(AEP,F-AEP,UK)...CERAMIC 0.01MF	20% 16V
C106	1-162-199-31	(AEP,F-AEP,UK)...CERAMIC 10PF	5% 50V
C107	1-162-191-31	(AEP,F-AEP,UK)...CERAMIC 2.2PF	10% 50V
C108	1-162-203-31	(AEP,F-AEP,UK)...CERAMIC 15PF	5% 50V
C109	1-162-286-31	(AEP,F-AEP,UK)...CERAMIC 220PF	10% 50V
C110	1-162-187-31	(AEP,F-AEP,UK)...CERAMIC 1PF	20% 50V
C111	1-162-306-31	(AEP,F-AEP,UK)...CERAMIC 0.01MF	20% 16V
C112	1-162-211-31	(AEP,F-AEP,UK)...CERAMIC 33PF	5% 50V
C113	1-162-203-31	(AEP,F-AEP,UK)...CERAMIC 15PF	5% 50V
C114	1-162-198-31	(AEP,F-AEP,UK)...CERAMIC 8.2PF	10% 50V
C115	1-162-196-31	(AEP,F-AEP,UK)...CERAMIC 5.6PF	10% 50V
C116	1-162-191-31	(AEP,F-AEP,UK)...CERAMIC 2.2PF	10% 50V
C117	1-162-306-31	CERAMIC	0.01MF 20% 16V
C118	1-123-332-00	ELECT	47MF 20% 25V
C119	1-101-005-00	CERAMIC	0.022MF 50V
C201	1-101-005-00	CERAMIC	0.022MF 50V
C202	1-101-005-00	CERAMIC	0.022MF 50V
C203	1-101-005-00	CERAMIC	0.022MF 50V
C204	1-162-211-31	(AEP,F-AEP,UK)...CERAMIC 33PF	5% 50V
C204	1-162-290-31	(G-AEP,F-G-AEP)...CERAMIC 470PF	10% 50V
C205	1-123-380-00	ELECT	1MF 20% 50V
C206	1-101-005-00	CERAMIC	0.022MF 50V
C207	1-123-332-00	ELECT	47MF 20% 16V
C208	1-101-005-00	CERAMIC	0.022MF 50V
C209	1-101-005-00	CERAMIC	0.022MF 50V
C210	1-101-005-00	CERAMIC	0.022MF 50V
C211	1-101-005-00	CERAMIC	0.022MF 50V
C212	1-123-380-00	ELECT	1MF 20% 50V
C301	1-123-332-00	ELECT	47MF 20% 16V
C302	1-123-380-00	ELECT	1MF 20% 50V
C303	1-123-379-00	ELECT	0.47MF 20% 50V
C304	1-123-380-00	ELECT	1MF 20% 50V
C305	1-123-380-00	ELECT	1MF 20% 50V
C401	1-101-005-00	CERAMIC	0.001MF 10% 50V
C402	1-101-005-00	CERAMIC	0.022MF 20% 50V
C403	1-123-356-00	ELECT	10MF 20% 50V
C404	1-101-005-00	CERAMIC	0.022MF 50V
C405	1-101-005-00	CERAMIC	0.022MF 50V
C407	1-162-215-31	CERAMIC	47PF 5% 50V
C408	1-161-494-00	CERAMIC	0.022MF 30% 25V
C409	1-162-294-31	CERAMIC	0.001MF 10% 50V
C410	1-130-487-00	MYLAR	0.022MF 5% 50V
C411	1-101-005-00	CERAMIC	0.022MF 50V
C412	1-101-005-00	CERAMIC	0.022MF 50V
C413	1-162-306-31	CERAMIC	0.01MF 20% 16V
C414	1-101-005-00	CERAMIC	0.022MF 50V
C415	1-123-379-00	ELECT	0.47MF 20% 50V
C416	1-123-332-00	ELECT	47MF 20% 16V
C417	1-123-382-00	ELECT	3.3MF 20% 50V
C418	1-123-369-00	ELECT	4.7MF 20% 50V
C419	1-123-382-00	ELECT	3.3MF 20% 50V
C420	1-101-005-00	CERAMIC	0.022MF 50V
C421	1-162-306-31	CERAMIC	0.01MF 20% 16V
C422	1-161-494-00	CERAMIC	0.022MF 30% 25V
C423	1-101-005-00	CERAMIC	0.022MF 50V
C424	1-102-949-00	CERAMIC	12PF 5% 50V
C425	1-102-880-00	CERAMIC	15PF 5% 50V
C426	1-104-069-00	POLYSTYRENE	470PF 5% 50V
C428	1-102-701-00	CERAMIC	91PF 5% 50V
C429	1-103-707-00	STYROL	180PF 5% 50V
C430	1-101-005-00	CERAMIC	0.022MF 50V
C431	1-102-966-00	CERAMIC	43PF 5% 50V
C432	1-162-303-31	CERAMIC	0.0033MF 20% 16V

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS:

All resistors are in ohms.

F : nonflammable

COILS

MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

ELECTRICAL PARTS							ELECTRICAL PARTS						
Ref.No.	Part No.	Description					Ref.No.	Part No.	Description				
C433	1-161-494-00	CERAMIC	0.022MF	30%	25V		D602	8-719-107-94	DIODE 1SS202-1				
C434	1-101-005-00	CERAMIC	0.022MF		50V		D603	8-719-107-94	DIODE 1SS202-1				
C501	1-101-005-00	CERAMIC	0.022MF		50V		D604	8-719-107-94	DIODE 1SS202-1				
C502	1-123-333-00	ELECT	100MF	20%	16V		D605	8-719-107-94	DIODE 1SS202-1				
C503	1-101-005-00	CERAMIC	0.022MF		50V		D606	8-719-107-94	DIODE 1SS202-1				
C504	1-123-307-00	ELECT	100MF	20%	10V		D607	8-719-107-94	DIODE 1SS202-1				
C505	1-101-005-00	CERAMIC	0.022MF		50V		D608	8-719-107-94	DIODE 1SS202-1				
C506	1-101-005-00	CERAMIC	0.022MF		50V		D609	8-719-107-94	DIODE 1SS202-1				
C601	1-101-005-00	CERAMIC	0.022MF		50V		D610	8-719-107-94	DIODE 1SS202-1				
C602	1-123-307-00	ELECT	100MF	20%	10V		D611	8-719-107-94	DIODE 1SS202-1				
C603	1-102-852-00	CERAMIC	47PF	5%	50V		D612	8-719-107-94	DIODE 1SS202-1				
C604	1-102-852-00	CERAMIC	47PF	5%	50V		D613	8-719-107-94	DIODE 1SS202-1				
C605	1-123-380-00	ELECT	1MF	20%	50V		D615	8-719-107-94	DIODE 1SS202-1				
C606	1-101-005-00	CERAMIC	0.022MF		50V		D616	8-719-107-94	DIODE 1SS202-1				
C607	1-162-306-31	CERAMIC	0.01MF	20%	16V		D617	8-719-107-94	DIODE 1SS202-1				
C608	1-101-005-00	CERAMIC	0.022MF		50V		FE101	1-463-611-11	(G-AEP,F-G-AEP)...FRONT END, FM (FEE-4013A)				
C609	1-123-356-00	ELECT	10MF	20%	50V		FL201	1-235-126-00	ENCAPSULATED COMPONENT				
C610	1-101-005-00	CERAMIC	0.022MF		50V		IC201	8-759-812-31	IC LA1231				
C611	1-123-332-00	ELECT	47MF	20%	16V		IC301	8-759-801-80	IC LA3401				
C612	1-136-171-00	FILM	0.33MF	5%	50V		IC401	8-759-812-45	IC LA1245				
C613	1-130-487-00	MYLAR	0.022MF	5%	50V		IC601	8-759-204-24	IC TC9302F-005				
C614	1-123-609-00	ELECT	0.33MF	20%	50V		IC602	8-759-202-63	IC TC9172P				
C615	1-136-171-00	FILM	0.33MF	5%	50V		L101	*1-422-214-11	(AEP,F-AEP,UK)...COIL, AIR-CORE				
C616	1-130-487-00	MYLAR	0.022MF	5%	50V		L102	*1-422-040-00	(AEP,F-AEP,UK)...COIL, AIR-CORE				
C617	1-123-609-00	ELECT	0.33MF	20%	50V		L103	*1-422-081-00	(AEP,F-AEP,UK)...COIL (WITH CORE)				
C630	1-162-294-31	CERAMIC	0.001	10%	50V		L104	*1-422-039-00	(AEP,F-AEP,UK)...COIL, AIR-CORE				
C631	1-101-005-00	CERAMIC	0.022MF		50V		L105	*1-459-396-00	(AEP,F-AEP,UK)...COIL (WITH CORE)				
CF201	1-527-968-00	FILTER, CERAMIC					L301	1-408-924-00	MICRO INDUCTOR 10MMH				
CF202	1-527-968-00	FILTER, CERAMIC					L302	1-408-924-00	MICRO INDUCTOR 10MMH				
CF203	1-527-968-00	(G-AEP,F-G-AEP)...FILTER, CERAMIC					L401	1-402-151-11	ANTENNA, FERRITE-ROD (LW/MW)				
CF401	1-527-937-00	FILTER, CERAMIC					L402	1-406-089-11	COIL (OSC)				
CF402	1-527-981-00	FILTER, CERAMIC					L403	1-406-090-11	COIL (OSC)				
CNJ101*1-562-327-00	(AEP,F-AEP,UK)...SOCKET, CONNECTOR 3P						LCD1	1-806-874-11	INDICATOR, L-CRYSTAL LT5056				
CNJ201*1-560-060-00	PIN, CONNECTOR 2P (NULL CHECK POINT)						PL501	1-518-511-21	LAMP, PILOT, YELLOW				
CNJ301 1-562-479-12	SOCKET, CONNECTOR 10P						Q101	8-729-353-52	(AEP,G-AEP,UK)...TRANSISTOR 2SC535				
CNJ601*1-560-604-00	PIN, CONNECTOR 5P						Q102	8-729-353-52	(AEP,G-AEP,UK)...TRANSISTOR 2SC535				
CNJ602*1-560-602-00	PIN, CONNECTOR 3P						Q103	8-729-672-42	(AEP,G-AEP,UK)...TRANSISTOR 2SC2724-C				
CNJ603*1-560-603-00	PIN, CONNECTOR 4P						Q104	8-729-672-42	(AEP,G-AEP,UK)...TRANSISTOR 2SC2724-C				
CT401	1-141-227-00	CAP, CERAMIC TRIMMER					Q201	8-729-672-42	TRANSISTOR 2SC2724-C				
CT402	1-141-227-00	CAP, CERAMIC TRIMMER					Q301	8-729-606-33	TRANSISTOR 2SC2603-F				
CT403	1-141-227-00	CAP, CERAMIC TRIMMER					Q302	8-729-606-33	TRANSISTOR 2SC2603-F				
CT404	1-141-227-00	CAP, CERAMIC TRIMMER					Q303	8-729-900-63	TRANSISTOR DTA124ES				
D101	8-719-918-45	(AEP,G-AEP,UK)...DIODE KV1310					Q304	8-729-900-36	TRANSISTOR DTC124ES				
D102	8-719-918-45	(AEP,G-AEP,UK)...DIODE KV1310					Q305	8-729-900-36	TRANSISTOR DTC124ES				
D103	8-719-918-45	(AEP,G-AEP,UK)...DIODE KV1310					Q401	8-729-606-33	TRANSISTOR 2SC2603-F				
D105	8-719-107-94	(AEP,G-AEP,UK)...DIODE 1SS202-1					Q402	8-729-606-33	TRANSISTOR 2SC2603-F				
D201	8-719-107-94	DIODE 1SS202-1					Q403	8-729-606-33	TRANSISTOR 2SC2603-F				
D202	8-719-107-94	DIODE 1SS202-1					Q404	8-729-606-33	TRANSISTOR 2SC2603-F				
D301	8-719-904-08	DIODE SLH54VC3					Q405	8-729-173-37	TRANSISTOR 2SA733-P				
D302	8-719-107-94	DIODE 1SS202-1					Q406	8-729-606-33	TRANSISTOR 2SC2603-F				
D303	8-719-107-94	DIODE 1SS202-1					Q407	8-729-606-33	TRANSISTOR 2SC2603-F				
D304	8-719-107-94	DIODE 1SS202-1					Q501	8-729-288-02	TRANSISTOR 2SD880				
D401	8-719-107-94	DIODE 1SS202-1					Q502	8-729-224-61	TRANSISTOR 2SK246-Y				
D402	8-719-902-79	DIODE KV1236Z					Q601	8-729-201-56	TRANSISTOR 2SK246-GR2				
D403	8-719-902-79	DIODE KV1236Z					Q602	8-729-606-33	TRANSISTOR 2SC2603-F				
D422	8-719-107-94	DIODE 1SS202-1					Q603	8-729-201-56	TRANSISTOR 2SK246-GR2				
D501	8-719-910-23	DIODE HZ12A3L											
D502	8-719-910-64	DIODE HZ6B1L											
D601	8-719-107-94	DIODE 1SS202-1											

ELECTRICAL PARTS

Ref.No.	Part No.	Description					
Q604	8-729-606-33	TRANSISTOR 2SC2603-F					
Q605	8-729-900-36	TRANSISTOR DTC124ES					
Q606	8-729-900-63	TRANSISTOR DTA124ES					
Q607	8-729-900-63	TRANSISTOR DTA124ES					
Q608	8-729-900-36	TRANSISTOR DTC124ES					
Q609	8-729-900-63	TRANSISTOR DTA124ES					
Q610	8-729-900-36	TRANSISTOR DTC124ES					
Q611	8-729-900-63	TRANSISTOR DTA124ES					
Q614	8-729-606-33	TRANSISTOR 2SC2603-F					
Q615	8-729-900-36	TRANSISTOR DTC124ES					
R101	1-249-441-11	(AEP,F·AEP,UK)...CARBON	100K	5%	1/6W		
R102	1-247-901-00	(AEP,F·AEP,UK)...CARBON	820K	5%	1/6W		
R103	1-249-405-00	(AEP,F·AEP,UK)...CARBON	100	5%	1/6W		
R104	1-249-405-00	(AEP,F·AEP,UK)...CARBON	100	5%	1/6W		
R105	1-249-441-11	(AEP,F·AEP,UK)...CARBON	100K	5%	1/6W		
R106	1-247-901-00	(AEP,F·AEP,UK)...CARBON	820K	5%	1/6W		
R107	1-247-819-00	(AEP,F·AEP,UK)...CARBON	330	5%	1/6W		
R108	1-247-795-00	(AEP,F·AEP,UK)...CARBON	33	5%	1/6W		
R108	1-249-405-00	(G-AEP,F·G-AEP)...CARBON	100	5%	1/6W		
R109	1-249-405-00	(AEP,F·AEP,UK)...CARBON	100	5%	1/6W		
R110	1-247-893-00	(AEP,F·AEP,UK)...CARBON	390K	5%	1/6W		
R111	1-249-425-11	(AEP,F·AEP,UK)...CARBON	4.7K	5%	1/6W		
R112	1-247-859-00	(AEP,F·AEP,UK)...CARBON	15K	5%	1/6W		
R113	1-247-893-00	(AEP,F·AEP,UK)...CARBON	390K	5%	1/6W		
R114	1-249-405-00	(AEP,F·AEP,UK)...CARBON	100	5%	1/6W		
R115	1-247-799-00	CARBON	47	5%	1/6W		
R116	1-247-706-11	(G-AEP,F·G-AEP)...CARBON	330	5%	1/4W		
R201	1-247-901-00	CARBON	820K	5%	1/6W		
R202	1-247-819-00	CARBON	330	5%	1/6W		
R203	1-247-819-00	CARBON	330	5%	1/6W		
R204	1-247-873-00	CARBON	56K	5%	1/6W		
R205	1-249-417-11	CARBON	1K	5%	1/6W		
R206	1-247-859-00	CARBON	15K	5%	1/6W		
R207	1-249-433-11	CARBON	22K	5%	1/6W		
R208	1-247-799-00	CARBON	47	5%	1/6W		
R209	1-247-859-00	CARBON	15K	5%	1/6W		
R210	1-249-441-11	CARBON	100K	5%	1/6W		
R211	1-249-429-11	CARBON	10K	5%	1/6W		
R301	1-247-799-00	CARBON	47	5%	1/6W		
R302	1-249-423-11	CARBON	3.3K	5%	1/6W		
R303	1-249-435-11	CARBON	33K	5%	1/6W		
R304	1-247-833-00	CARBON	1.2K	5%	1/6W		
R305	1-249-437-11	CARBON	47K	5%	1/6W		
R306	1-249-437-11	CARBON	47K	5%	1/6W		
R307	1-249-419-11	CARBON	1.5K	5%	1/6W		
R308	1-249-419-11	CARBON	1.5K	5%	1/6W		
R309	1-249-429-11	CARBON	10K	5%	1/6W		
R310	1-249-429-11	CARBON	10K	5%	1/6W		
R312	1-249-437-11	CARBON	47K	5%	1/6W		
R313	1-249-417-11	CARBON	1K	5%	1/6W		
R314	1-249-437-11	CARBON	47K	5%	1/6W		
R316	1-249-437-11	CARBON	47K	5%	1/6W		
R319	1-249-437-11	CARBON	47K	5%	1/6W		
R320	1-249-437-11	CARBON	47K	5%	1/6W		
R322	1-249-437-11	CARBON	47K	5%	1/6W		
R330	1-247-853-00	CARBON	8.2K	5%	1/6W		
R401	1-249-421-11	CARBON	2.2K	5%	1/6W		
R402	1-249-405-00	CARBON	100	5%	1/6W		
R403	1-249-414-11	CARBON	560	5%	1/6W		

ELECTRICAL PARTS

Ref.No.	Part No.	Description					
R404	1-249-423-11	CARBON	3.3K	5%	1/6W		
R405	1-247-799-00	CARBON	47	5%	1/6W		
R406	1-249-429-11	CARBON	10K	5%	1/6W		
R407	1-249-405-00	CARBON	100	5%	1/6W		
R408	1-249-429-11	CARBON	10K	5%	1/6W		
R409	1-247-811-00	CARBON	150	5%	1/6W		
R410	1-247-857-00	CARBON	12K	5%	1/6W		
R411	1-249-429-11	CARBON	10K	5%	1/6W		
R413	1-249-433-11	CARBON	22K	5%	1/6W		
R414	1-249-429-11	CARBON	10K	5%	1/6W		
R415	1-249-429-11	CARBON	10K	5%	1/6W		
R418	1-249-433-11	CARBON	22K	5%	1/6W		
R419	1-249-429-11	CARBON	10K	5%	1/6W		
R420	1-249-429-11	CARBON	10K	5%	1/6W		
R421	1-249-433-11	CARBON	22K	5%	1/6W		
R422	1-249-429-11	CARBON	10K	5%	1/6W		
R423	1-249-433-11	CARBON	22K	5%	1/6W		
R432	1-247-903-00	CARBON	1M	5%	1/6W		
R433	1-249-429-11	CARBON	10K	5%	1/6W		
R434	1-249-429-11	CARBON	10K	5%	1/6W		
R435	1-249-429-11	CARBON	10K	5%	1/6W		
R436	1-247-819-00	CARBON	330	5%	1/6W		
R437	1-249-437-11	CARBON	47K	5%	1/6W		
R439	1-249-429-11	CARBON	10K	5%	1/6W		
R501	1-247-815-00	CARBON	220	5%	1/6W		
R502	1-247-823-00	CARBON	470	5%	1/6W		
R503	1-247-775-00	CARBON	4.7	5%	1/6W		
R504	1-249-417-11	CARBON	1K	5%	1/6W		
R601	1-249-425-11	CARBON	4.7K	5%	1/6W		
R602	1-249-441-11	CARBON	100K	5%	1/6W		
R603	1-249-435-11	CARBON	33K	5%	1/6W		
R604	1-249-423-00	CARBON	3.3K	5%	1/6W		
R605	1-249-441-11	CARBON	100K	5%	1/6W		
R606	1-247-435-11	CARBON	33K	5%	1/6W		
R607	1-247-797-00	CARBON	39	5%	1/6W		
R608	1-247-799-00	CARBON	47	5%	1/6W		
R609	1-249-437-11	CARBON	47K	5%	1/6W		
R610	1-247-817-00	CARBON	270	5%	1/6W		
R611	1-247-829-00	CARBON	820	5%	1/6W		
R612	1-249-414-11	CARBON	560	5%	1/6W		
R613	1-249-435-00	CARBON	33K	5%	1/6W		
R614	1-249-421-11	CARBON	2.2K	5%	1/6W		
R615	1-249-425-11	CARBON	4.7K	5%	1/6W		
R616	1-249-425-11	CARBON	4.7K	5%	1/6W		
R617	1-249-437-11	CARBON	47K	5%	1/6W		
R618	1-247-817-00	CARBON	270	5%	1/6W		
R619	1-247-829-00	CARBON	820	5%	1/6W		
R620	1-249-414-11	CARBON	560	5%	1/6W		
R621	1-247-885-00	CARBON	180K	5%	1/6W		
R622	1-249-421-11	CARBON	2.2K	5%	1/6W		
R623	1-249-425-11	CARBON	4.7K	5%	1/6W		
R624	1-249-425-11	CARBON	4.7K	5%	1/6W		
R625	1-247-891-00	CARBON	330K	5%	1/6W		
R640	1-249-435-11	CARBON	33K	5%	1/6W		
R643	1-249-441-11	CARBON	100K	5%	1/6W		
R644	1-249-425-11	CARBON	4.7K	5%	1/6W		

ELECTRICAL PARTS

<u>Ref.No.</u>	<u>Part No.</u>	<u>Description</u>
RV201	1-228-997-00	RES, ADJ, CARBON 100K
RV301	1-228-997-00	(AEP,F-AEP,UK)...RES, ADJ, CARBON 100K
RV301	1-228-998-00	(G-AEP,F-G-AEP)..RES, ADJ, CARBON 220K
S701	1-554-303-21	SWITCH, KEY BOARD (BAND)
S702	1-554-303-21	SWITCH, KEY BOARD (STEREO MUTING)
S703	1-554-303-21	SWITCH, KEY BOARD (MEMORY)
S704	1-554-303-21	SWITCH, KEY BOARD (TUNING -)
S705	1-554-303-21	SWITCH, KEY BOARD (TUNING +)
S706	1-554-303-21	SWITCH, KEY BOARD (PRESET 1)
S707	1-554-303-21	SWITCH, KEY BOARD (PRESET 2)
S708	1-554-303-21	SWITCH, KEY BOARD (PRESET 3)
S709	1-554-303-21	SWITCH, KEY BOARD (PRESET 4)
S710	1-554-303-21	SWITCH, KEY BOARD (PRESET 5)
T201	1-404-419-00	COIL, DISCRIMINATOR
T401	1-404-535-11	COIL (WITH IFT)
TM101	1-536-733-00	(G-AEP,F-G-AEP)TERMINAL BOARD, ANTENNA
TM101	1-536-901-11	(AEP,F-AEP,UK)TERMINAL BOARD 3P, ANTENNA
X301	1-567-250-11	OSCILLATOR, CERAMIC
X601	1-567-125-00	VIBRATOR, CRYSTAL

FM STEREO/FM-AM TUNER [ST-177R]

FH-15OR
ST-177R

(E model)

SECTION 1 BLOCK DIAGRAM

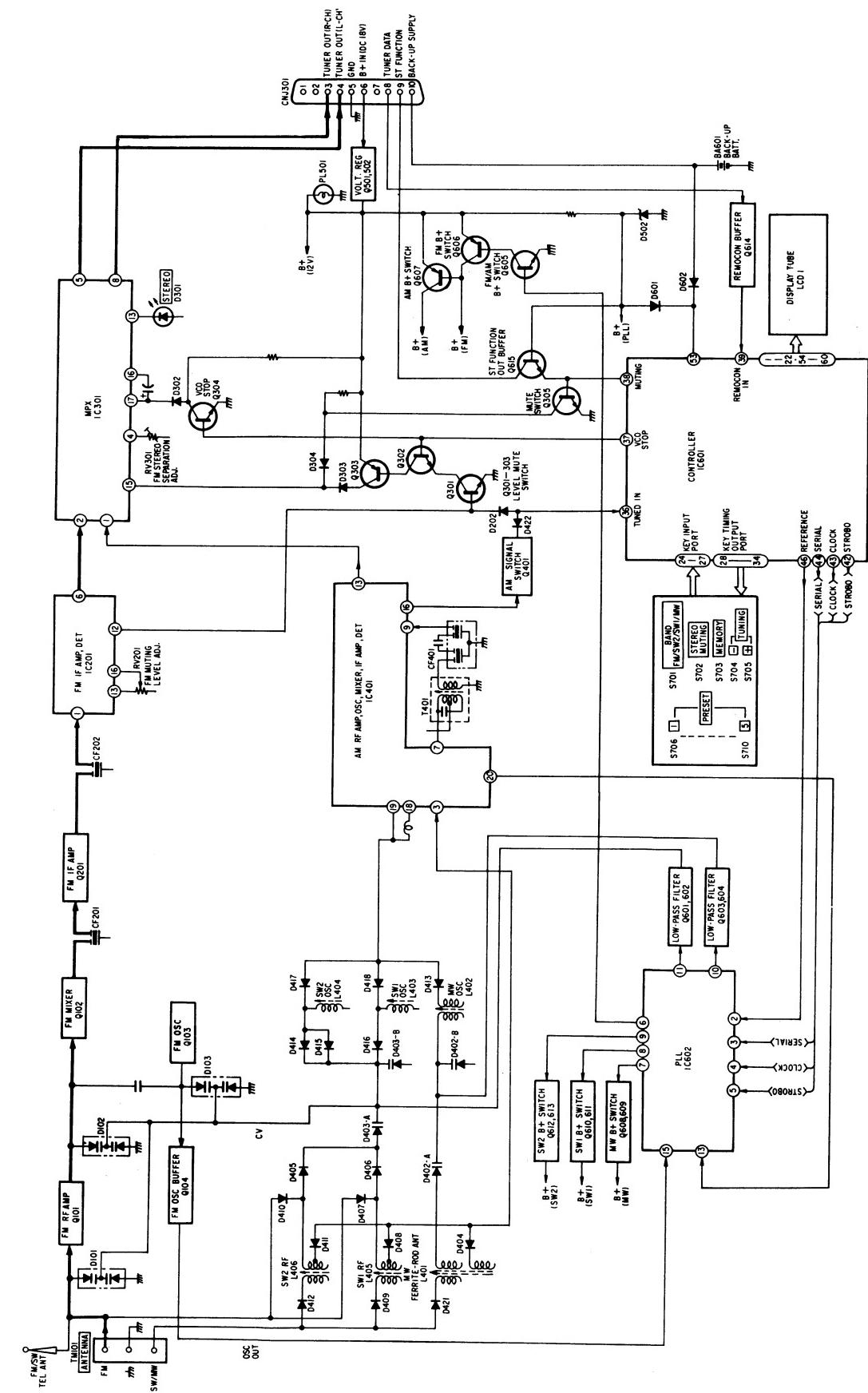
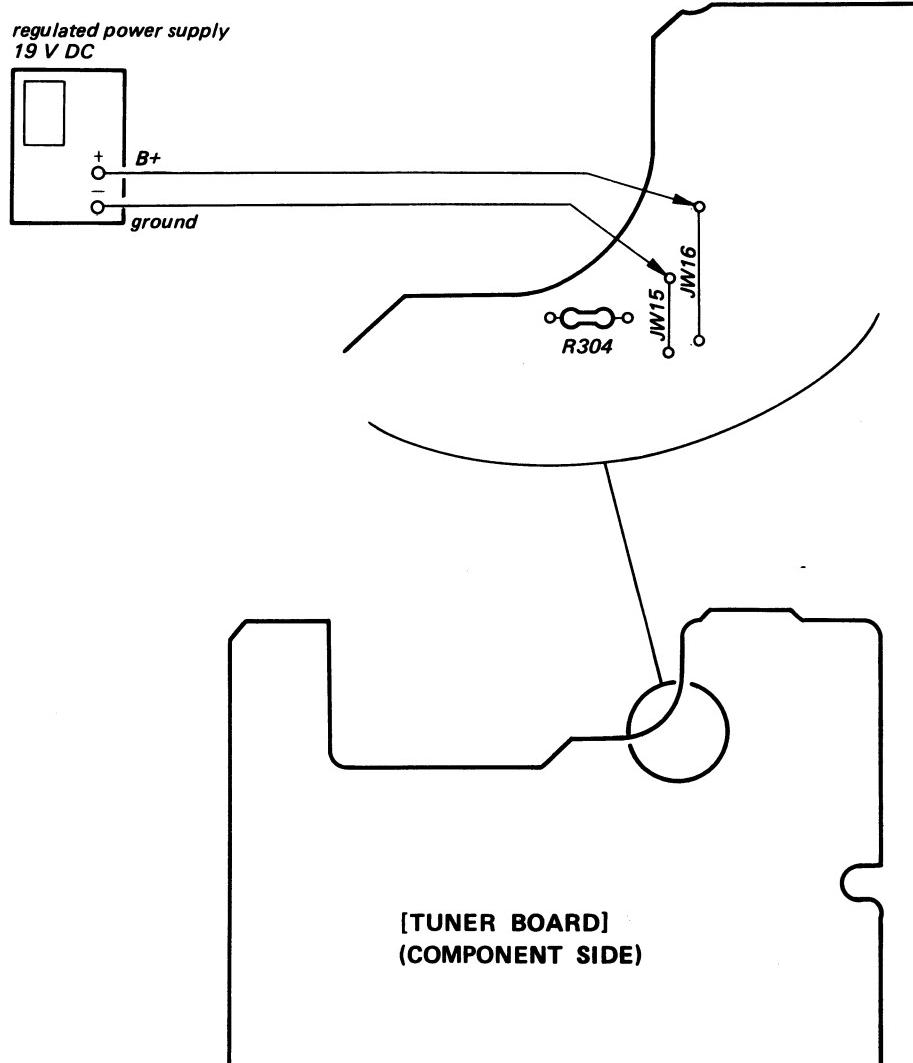
(E model)

REPAIRING PRECAUTION

[To apply B+ voltage]

The power of this unit is fed from TA-177R.

Because of this, connect the regulated power supply as illustrated below when this unit alone operates.



**SECTION 2
ADJUSTMENTS**

(E model)

**FH-15OR
ST-177R**

**FH-15OR
ST-177R**

(E model)

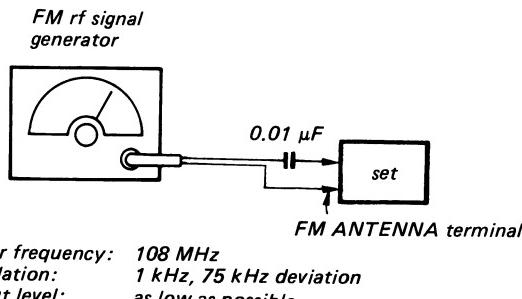
FM SECTION 1

Setting:

BAND selector switch . . . FM

FM OSC Voltage Adjustment

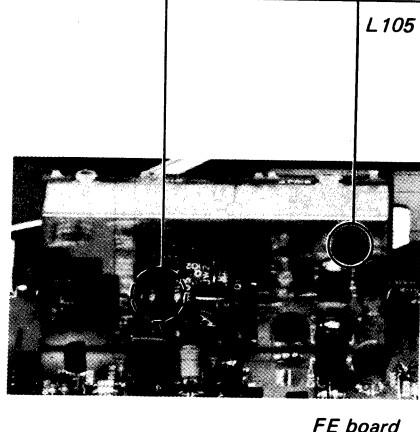
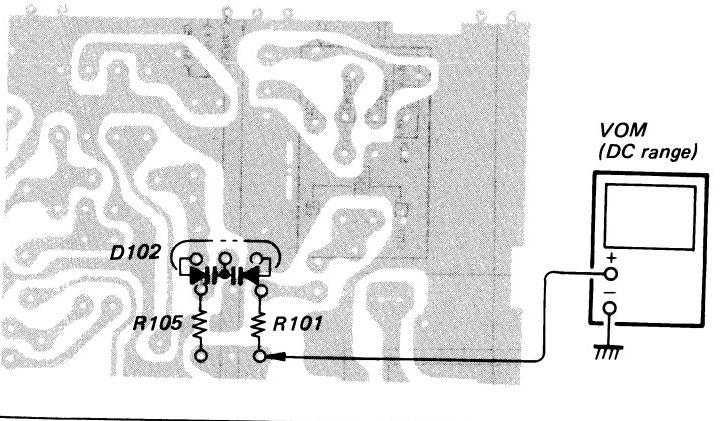
Setting:



Procedure:

1. Push the TUNING (+, -) button for 108 MHz.
2. Adjust L105 for 8.9 – 9 V reading on the VOM.

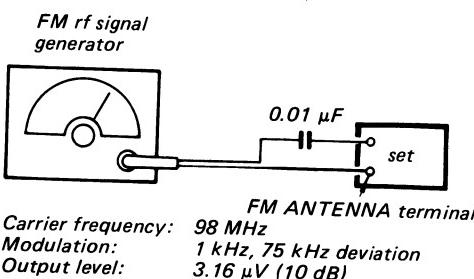
[FE BOARD] (CONDUCTOR SIDE)



FE board

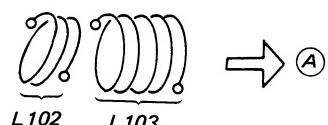
FM Tracking Adjustment

Setting:

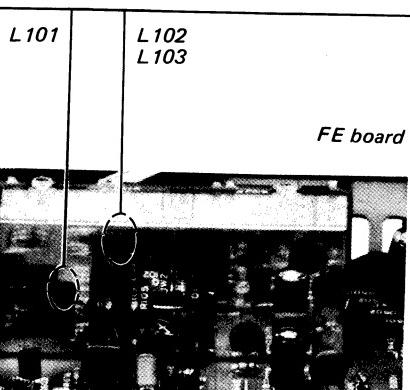


Procedure:

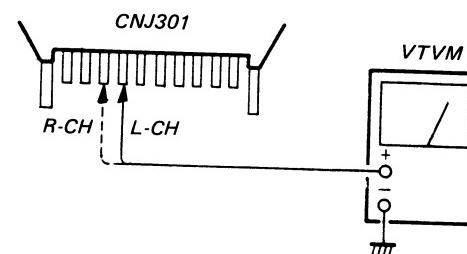
1. Push TUNING (+, -) button for 98 MHz.
2. Approach L102 and L103 not to contact each other.
3. Adjust L101 and L103, and repeat the adjustment 2 – 3 times for maximum VTVM reading.
(Adjust L103 in the direction as shown by)



Note: Do not touch L102.



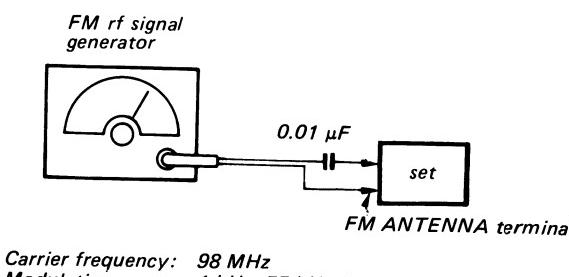
FE board



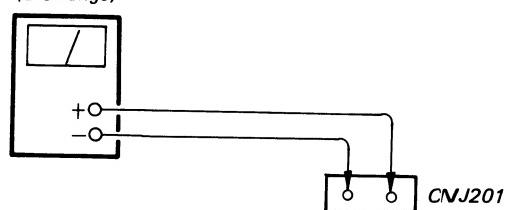
Note: FM discriminator alignment should be made after FM tracking adjustment.

FM Discriminator Alignment (NULL Check)

Setting:

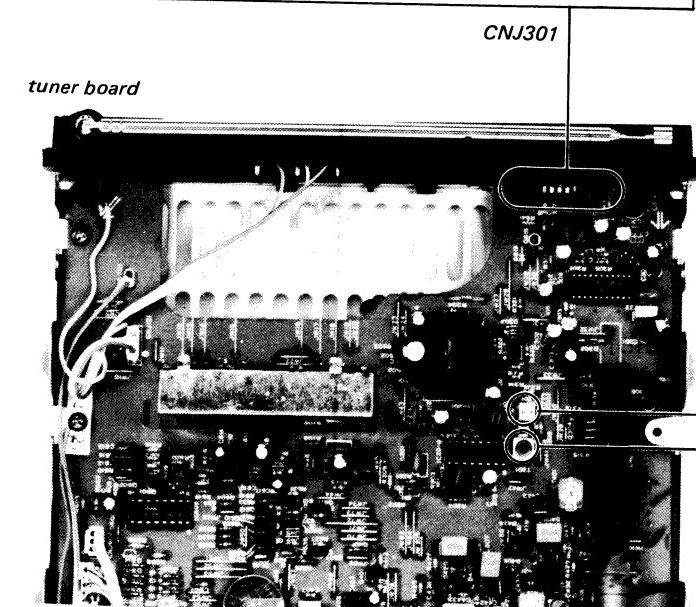


VOM
(DC range)



Procedure:

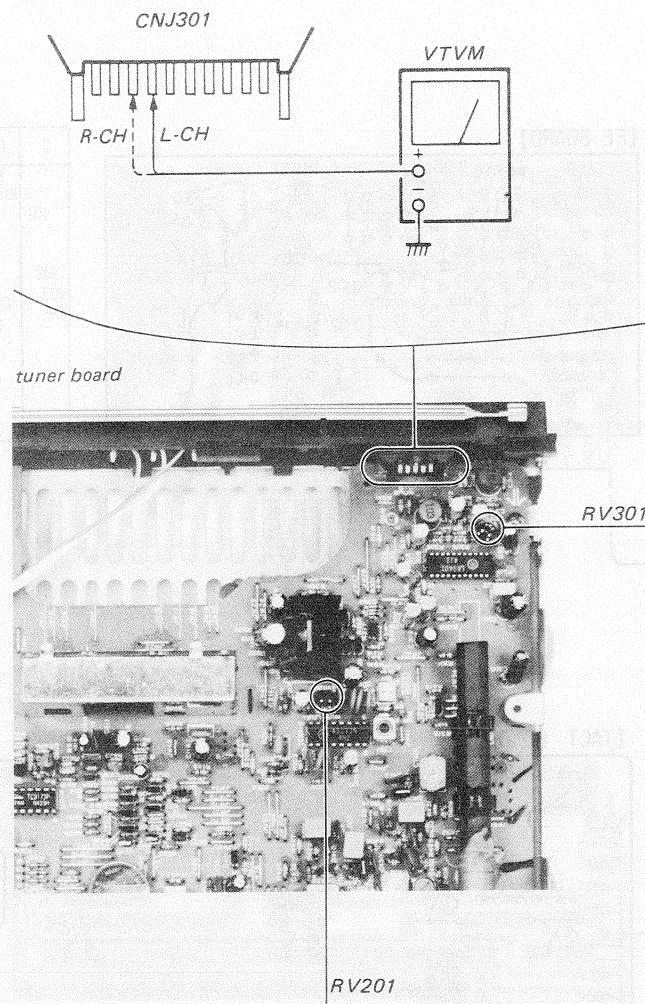
1. Push the TUNING (+, -) button for 98 MHz.
2. Adjust T201 for 0 V reading on the VOM.



CNJ201

T201

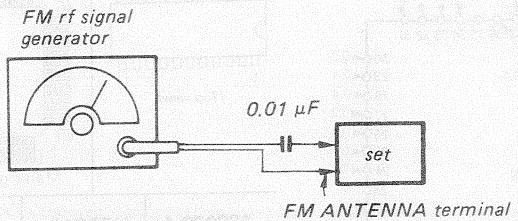
FM SECTION 2



FM Muting Level Adjustment

Setting:
STEREO MUTING switch . . . ON

Procedure:



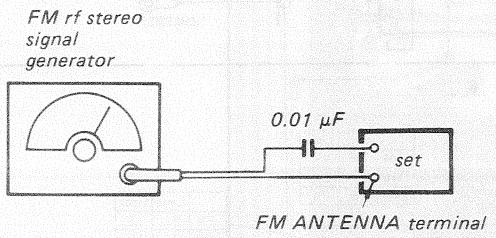
*Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: 17.9 μV (25 dB)*

- Push the TUNING (+, -) button for 98 MHz.
- Adjust RV201 for a point the VTVM reading just drops to 0 V.

FM Stereo Separation Adjustment

Setting:
STEREO MUTING switch . . . ON

Procedure:



*Carrier frequency: 98 MHz
Modulation: audio (1 kHz): 33.75 kHz deviation
pilot (19 kHz): 7.5 kHz deviation
sub-channel (38 kHz): 33.75 kHz deviation
Output level: 1 mV (60 dB)
Mode: stereo*

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	(A)
R-CH	L-CH	Adjust RV301 for minimum reading.
R-CH	R-CH	(C)
L-CH	R-CH	Adjust RV301 for minimum reading.

L-CH Stereo separation: (A) – (B)

R-CH Stereo separation: (C) – (D)

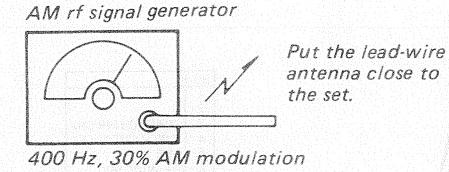
The separations of both channels should be equal.

AM SECTION

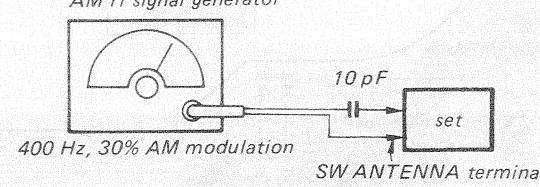
Setting:

BAND selector switch: MW, SW1 or SW2

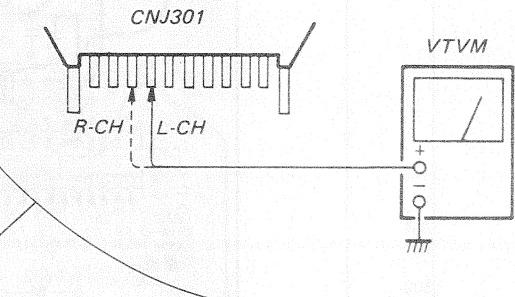
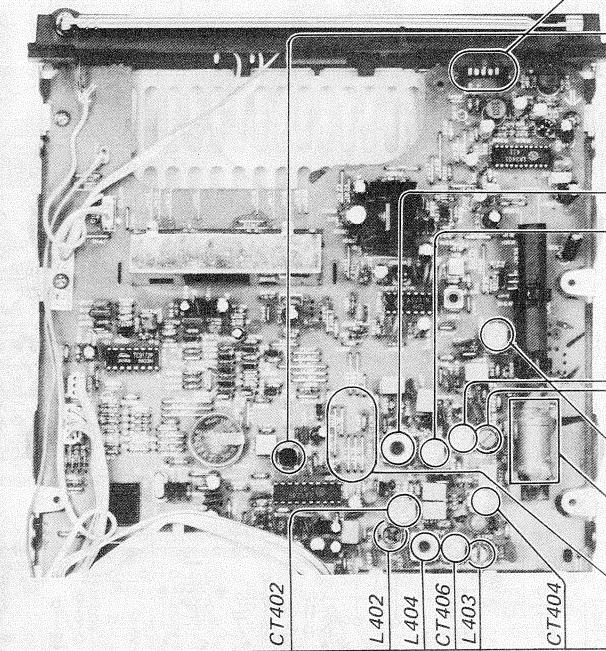
– MW –



– SW –



- Repeat the procedures in each adjustment several times, and the OSC voltage and tracking adjustments should be finally done by the timer capacitors.



AM IF ALIGNMENT

Adjust for a maximum reading on VTVM.

T401 450 kHz

SW2 TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L406 10 MHz	CT405 20 MHz

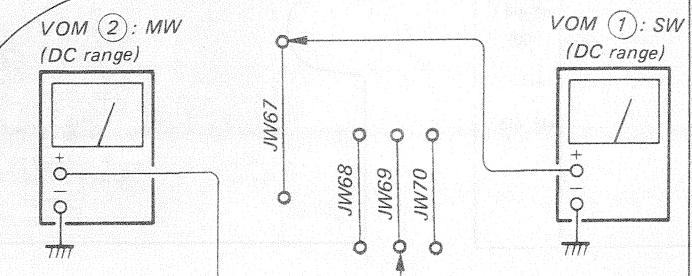
SW1 TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
CT403 6.5 MHz	L405 3.5 MHz

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
CT401 1,400 kHz	L401 600 kHz

MW/SW1/SW2 OSC Voltage Adjustment

Procedure:

- Set BAND selector switch to MW.
- Push TUNING (+, -) button for 530 kHz. Adjust L402 for 0.95 – 1.05 V VOM ② reading.
- Push the button for 1,610 kHz. Adjust CT402 for 8.9 – 9.0 V VOM ② reading.
- Set BAND selector switch to SW1.
- Push TUNING (+, -) button for 3.2 MHz. Adjust L403 for 0.95 – 1.05 V VOM ① reading.
- Push the button for 7.3 MHz. Adjust CT404 for 8.9 – 9.0 V VOM ① reading.
- Set BAND selector switch to SW2.
- Push TUNING (+, -) button for 9.5 MHz. Adjust L404 for 0.95 – 1.05 V VOM ① reading.
- Push the button for 21.75 MHz. Adjust CT406 for 8.9 – 9.0 V VOM ① reading.



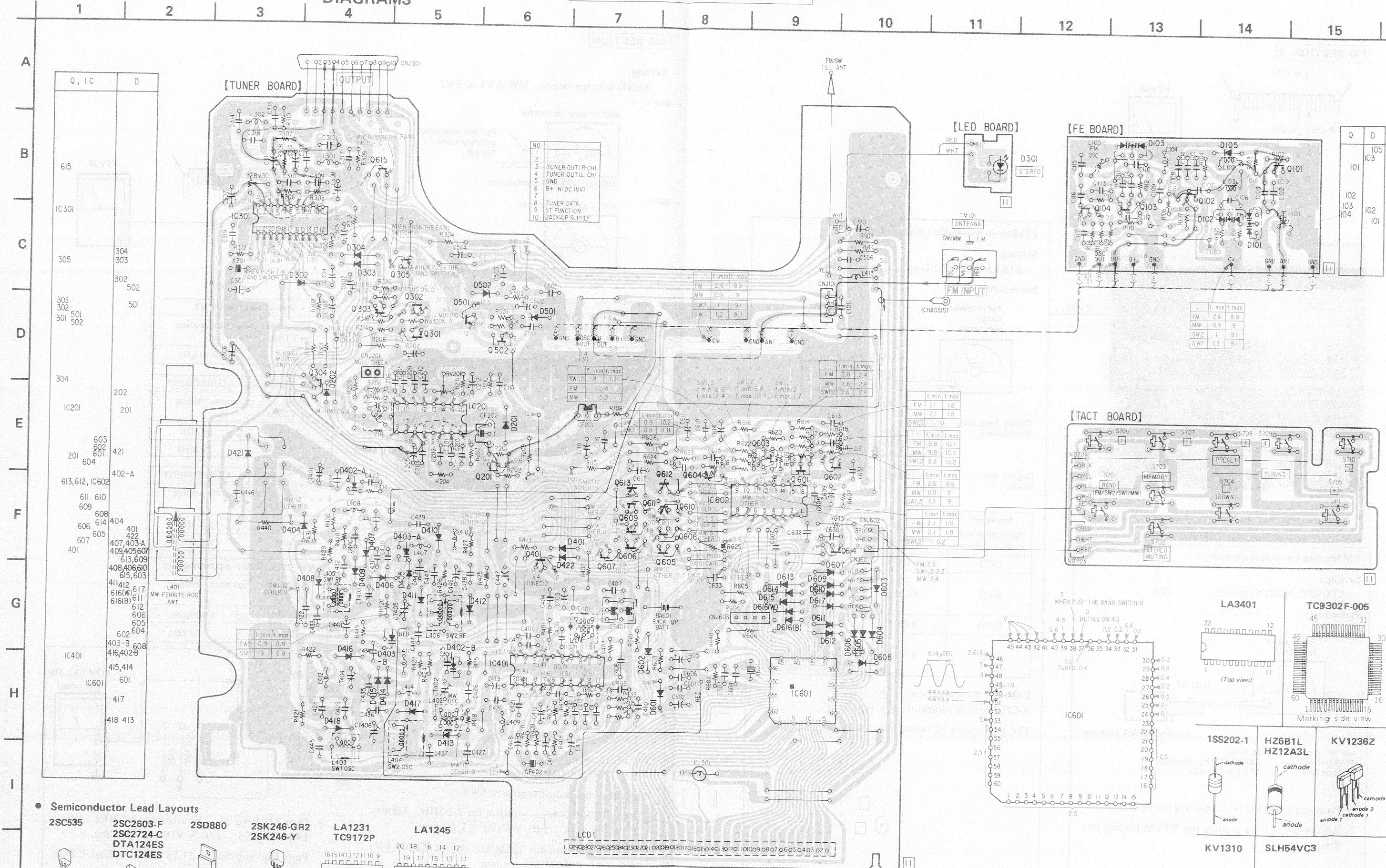
3-1. MOUNTING DIAGRAM
— Conductor Side —
● See page ST-11 for notes.

SECTION 3 DIAGRAMS

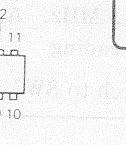
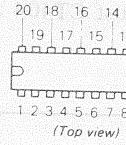
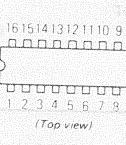
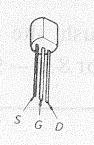
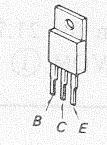
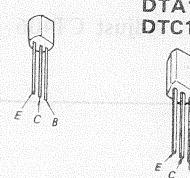
(E model)

FH-150R
ST-177R

(E model)



- Semiconductor Lead Layouts



3-1. MOUNTING DIAGRAM

- See page ST-11 for notes.

SECTION 3

DIAGRAMS

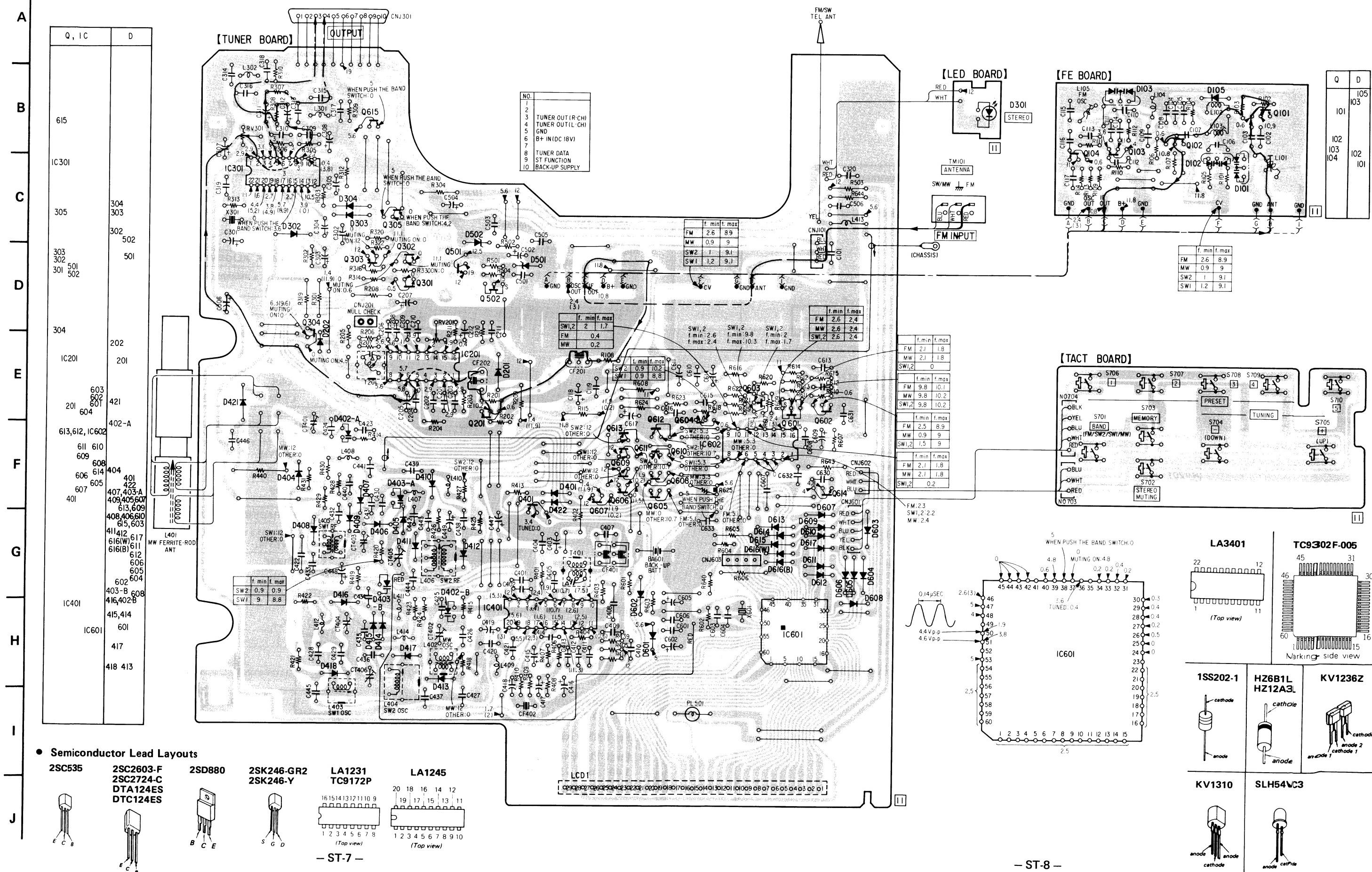
(E model)

FH-150R

FH-150R

(E model)

DIAGRAMS

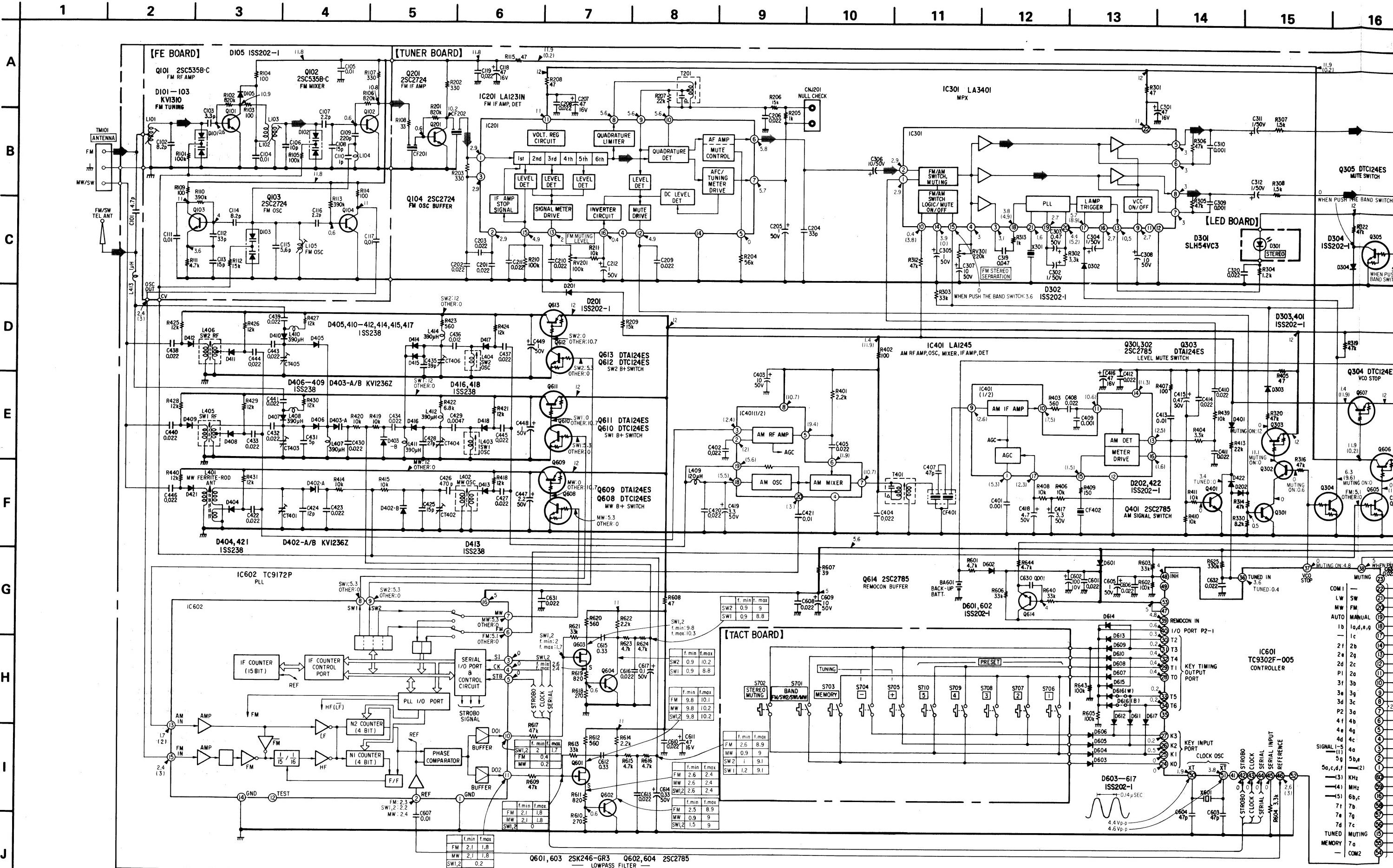


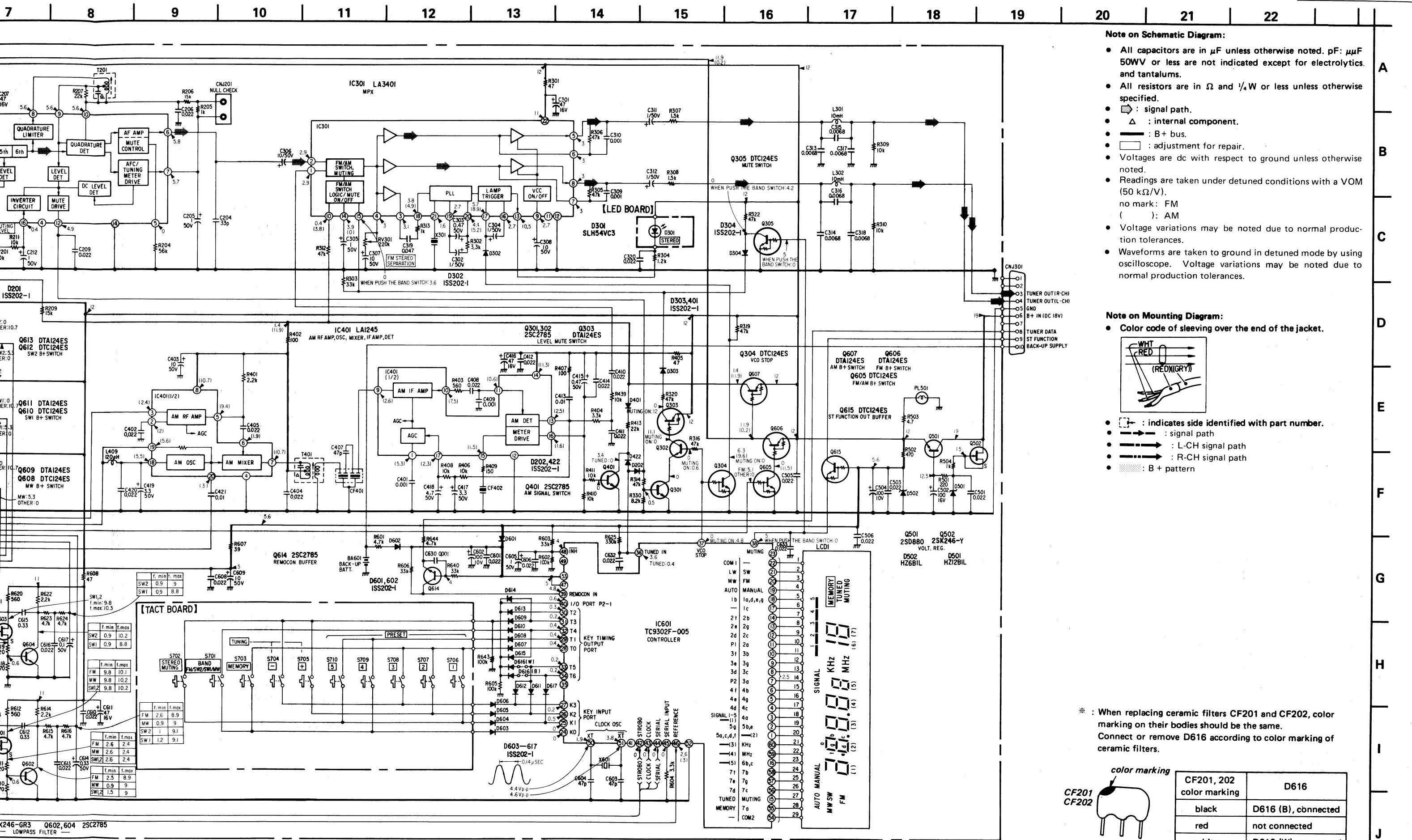
3-2. SCHEMATIC DIAGRAM

FH-150R
ST-177RFH-150R
ST-177R

(E model)

(E model)





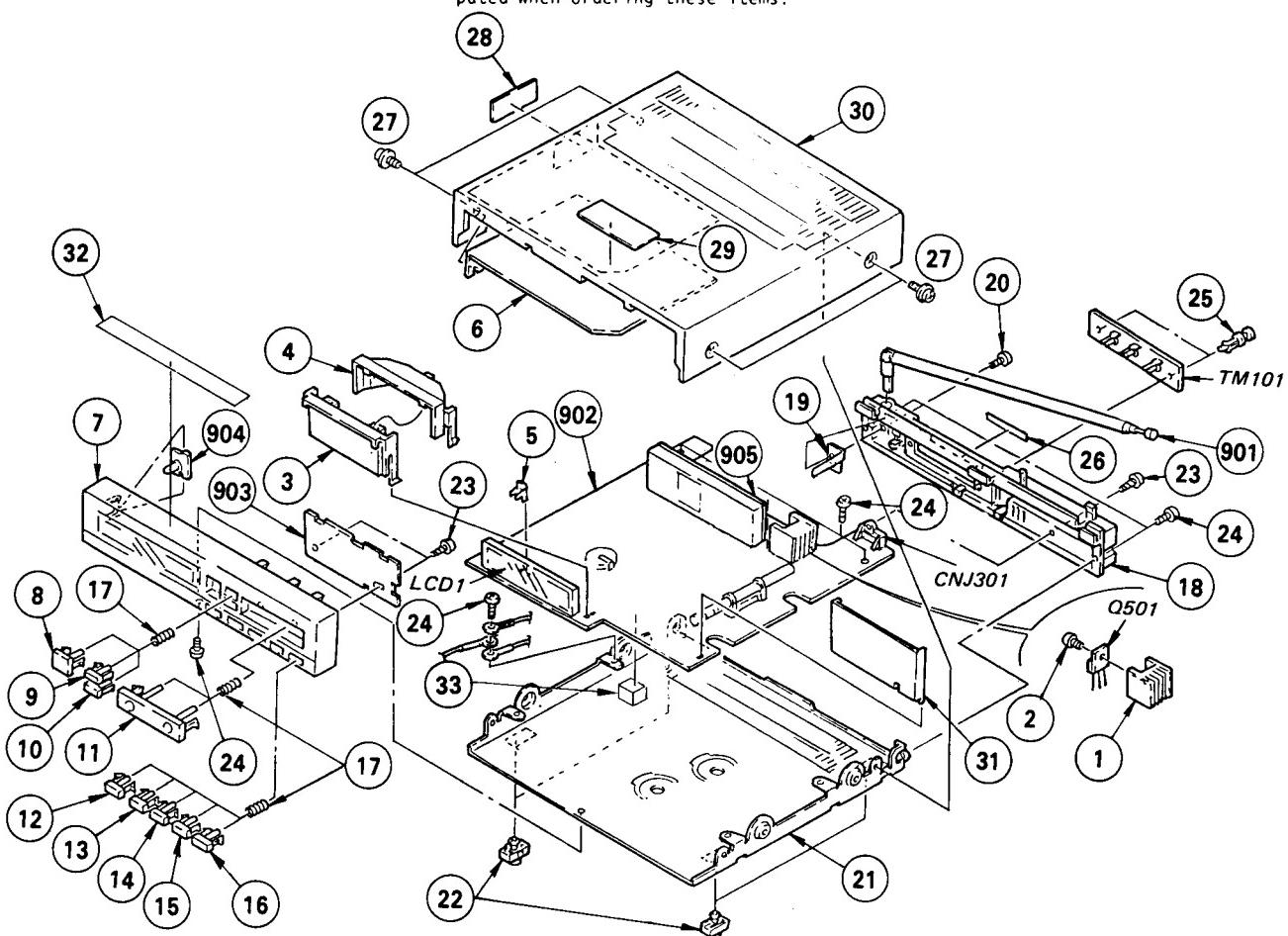
SECTION 4

EXPLODED VIEW AND PARTS LIST

NOTE:
The mechanical parts with no reference number in the exploded views are not supplied.

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The construction parts of an assembled part are indicated with a collation number in the remark column.



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	*4-363-146-21	HEAT SINK, V.OUT		22	X-4902-937-1	FOOT ASSY, RUBBER	
2	7-685-646-81	SCREW +BV 3X8 (S)		23	7-685-646-71	SCREW +BVTP 3X8 TYPE2 N-S	
3	*4-909-633-01	ILLUMINATOR		24	7-685-871-01	SCREW +BVTT 3X6 (S)	
4	*4-904-515-01	HOUSE, LAMP		25	4-829-039-00	RIVET, NYLON	
5	*4-904-507-01	BLIND, LAMP		26	*4-910-083-01	LABEL, ANTENNA	
6	*4-910-337-01	PLATE, SHIELD		27	4-886-821-21	SCREW, M3 CASE STOPPER	
7	X-4910-083-1	PANEL ASSY, FRONT		28	*4-914-317-01	LABEL, MODEL NUMBER	
8	4-910-093-11	BUTTON, SQUARE (BAND)		29	4-884-927-00	LABEL (SYSTEM), CAUTION	
9	4-910-087-01	BUTTON (B), SQUARE (STEREO MUTING)		30	X-4902-904-1	CASE ASSY (BLACK)	
10	4-910-087-71	BUTTON (B), SQUARE (MEMORY)		31	*4-910-090-01	PLATE, SHIELD	
11	4-910-094-11	BUTTON, SQUARE (TUNING)		32	4-884-873-00	SEAL, INDICATION, METER BAND	
12	4-914-314-01	BUTTON, SQUARE (PRESET 1)		33	9-911-842-XX	CUSHION	
13	4-914-314-11	BUTTON, SQUARE (PRESET 2)		901	1-501-321-11	ANTENNA, TELESCOPIC	
14	4-914-314-21	BUTTON, SQUARE (PRESET 3)		902	*A-4351-441-A	MOUNTED PCB, TUNER	
15	4-914-314-31	BUTTON, SQUARE (PRESET 4)		903	*1-615-520-11	PC BOARD, TACT	
16	4-914-314-41	BUTTON, SQUARE (PRESET 5)		904	*1-615-521-11	PC BOARD, LED	
17	4-886-032-00	SPRING, COMPRESSION		905	*1-615-522-11	PC BOARD, F.E	
18	4-910-098-01	PLATE, JACK		CNJ301	1-562-479-12	SOCKET, CONNECTOR 10P	
19	*4-910-081-01	TERMINAL BOARD, ROD ANTENNA		LCD1	1-806-874-11	INDICATOR, L-CRYSTAL LT5056	
20	7-682-548-09	SCREW +B 3X8		Q501	8-729-288-02	TRANSISTOR 2SD880	
21	*4-902-941-21	CHASSIS		TM101	1-536-901-11	TERMINAL BOARD 3P (ANTENNA)	

SECTION 5

ELECTRICAL PARTS LIST

NOTE:

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS

All resistors are in ohms.
F : nonflammable

COILS

MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

ELECTRICAL PARTS

Ref.No.	Part No.	Description
901	1-501-321-11	ANTENNA, TELESCOPIC
902	*A-4351-441-A	MOUNTED PCB, TUNER
903	*1-615-520-11	PC BOARD, TACT
904	*1-615-521-11	PC BOARD, LED
905	*1-615-522-11	PC BOARD, F.E
BA601	1-528-120-00	BATTERY, LITHIUM (CR-2025)

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
901	1-501-321-11	ANTENNA, TELESCOPIC	C309	1-162-294-31	CERAMIC
902	*A-4351-441-A	MOUNTED PCB, TUNER	C310	1-162-294-31	CERAMIC
903	*1-615-520-11	PC BOARD, TACT	C311	1-123-380-00	ELECT
904	*1-615-521-11	PC BOARD, LED	C312	1-123-380-00	ELECT
905	*1-615-522-11	PC BOARD, F.E	C313	1-162-305-31	CERAMIC
BA601	1-528-120-00	BATTERY, LITHIUM (CR-2025)	C314	1-162-305-31	CERAMIC
C101	1-162-195-31	CERAMIC	C315	1-162-305-31	CERAMIC
C102	1-162-198-31	CERAMIC	C316	1-162-305-31	CERAMIC
C103	1-162-193-31	CERAMIC	C317	1-162-305-31	CERAMIC
C104	1-162-306-31	CERAMIC	C318	1-162-305-31	CERAMIC
C105	1-162-306-31	CERAMIC	C319	1-130-491-00	MYLAR
C106	1-162-199-31	CERAMIC	C320	1-101-005-00	CERAMIC
C107	1-162-191-31	CERAMIC	C401	1-162-294-31	CERAMIC
C108	1-162-203-31	CERAMIC	C402	1-101-005-00	CERAMIC
C109	1-162-286-31	CERAMIC	C403	1-123-356-00	ELECT
C110	1-162-187-31	CERAMIC	C404	1-101-005-00	CERAMIC
C111	1-162-306-31	CERAMIC	C405	1-101-005-00	CERAMIC
C112	1-162-211-31	CERAMIC	C407	1-162-215-31	CERAMIC
C113	1-162-203-31	CERAMIC	C408	1-161-494-00	CERAMIC
C114	1-162-198-31	CERAMIC	C409	1-162-294-31	CERAMIC
C115	1-162-196-31	CERAMIC	C410	1-130-487-00	MYLAR
C116	1-162-191-31	CERAMIC	C411	1-101-005-00	CERAMIC
C117	1-162-306-31	CERAMIC	C412	1-101-005-00	CERAMIC
C118	1-123-332-00	ELECT	C413	1-162-306-31	CERAMIC
C119	1-101-005-00	CERAMIC	C414	1-101-005-00	CERAMIC
C201	1-101-005-00	CERAMIC	C415	1-123-379-00	ELECT
C202	1-101-005-00	CERAMIC	C416	1-123-332-00	ELECT
C203	1-101-005-00	CERAMIC	C417	1-123-382-00	ELECT
C204	1-162-211-31	CERAMIC	C418	1-123-369-00	ELECT
C205	1-123-380-00	ELECT	C419	1-123-382-00	ELECT
C206	1-101-005-00	CERAMIC	C420	1-101-005-00	CERAMIC
C207	1-123-332-00	ELECT	C421	1-162-306-31	CERAMIC
C208	1-101-005-00	CERAMIC	C422	1-161-494-00	CERAMIC
C209	1-101-005-00	CERAMIC	C423	1-101-005-00	CERAMIC
C210	1-101-005-00	CERAMIC	C424	1-102-949-00	CERAMIC
C211	1-101-005-00	CERAMIC	C425	1-102-880-00	CERAMIC
C212	1-123-380-00	ELECT	C426	1-104-069-00	POLYSTYRENE
C213	1-123-332-00	ELECT	C427	1-101-005-00	CERAMIC
C214	1-123-380-00	ELECT	C428	1-102-803-00	CERAMIC
C215	1-101-005-00	CERAMIC	C429	1-103-741-00	STYROL
C216	1-101-005-00	CERAMIC	C430	1-101-005-00	CERAMIC
C217	1-101-005-00	CERAMIC	C431	1-102-942-00	CERAMIC
C218	1-101-005-00	CERAMIC	C432	1-101-005-00	CERAMIC
C219	1-101-005-00	CERAMIC	C433	1-101-005-00	CERAMIC
C220	1-101-005-00	CERAMIC	C434	1-101-005-00	CERAMIC
C221	1-101-005-00	CERAMIC			
C222	1-101-005-00	CERAMIC			
C223	1-101-005-00	CERAMIC			
C224	1-101-005-00	CERAMIC			
C225	1-101-005-00	CERAMIC			
C226	1-101-005-00	CERAMIC			
C227	1-101-005-00	CERAMIC			
C228	1-101-005-00	CERAMIC			
C229	1-101-005-00	CERAMIC			
C230	1-101-005-00	CERAMIC	</		

SECTION 5

(E model)

FH-15OR
ST-177RFH-15OR
ST-177R

(E model)

NOTE:
 Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
 MF: μ F, PF: $\mu\mu$ F.

RESISTORS

All resistors are in ohms.
 F : nonflammable

COILS

MMH : mH, UH : μ H

SEMICONDUCTORS

In each case, U : μ , for example:
 UA...: μ A..., UPA...: μ PA..., UPC...: μ PC,
 UPD...: μ PD...

ELECTRICAL PARTS

Ref.No.	Part No.	Description
901	1-501-321-11	ANTENNA, TELESCOPIC
902	*A-4351-441-A	MOUNTED PCB, TUNER
903	*1-615-520-11	PC BOARD, TACT
904	*1-615-521-11	PC BOARD, LED
905	*1-615-522-11	PC BOARD, F.E
BA601	1-528-120-00	BATTERY, LITHIUM (CR-2025)
C101	1-162-195-31	CERAMIC 4.7PF 10% 50V
C102	1-162-198-31	CERAMIC 8.2PF 10% 50V
C103	1-162-193-31	CERAMIC 3.3PF 10% 50V
C104	1-162-306-31	CERAMIC 0.01MF 20% 16V
C105	1-162-306-31	CERAMIC 0.01MF 20% 16V
C106	1-162-199-31	CERAMIC 10PF 5% 50V
C107	1-162-191-31	CERAMIC 2.2PF 10% 50V
C108	1-162-203-31	CERAMIC 15PF 5% 50V
C109	1-162-286-31	CERAMIC 220PF 10% 50V
C110	1-162-187-31	CERAMIC 1PF 20% 50V
C111	1-162-306-31	CERAMIC 0.01MF 20% 16V
C112	1-162-211-31	CERAMIC 33PF 5% 50V
C113	1-162-203-31	CERAMIC 15PF 5% 50V
C114	1-162-198-31	CERAMIC 8.2PF 10% 50V
C115	1-162-196-31	CERAMIC 5.6PF 10% 50V
C116	1-162-191-31	CERAMIC 2.2PF 20% 50V
C117	1-162-306-31	CERAMIC 0.01MF 20% 16V
C118	1-123-332-00	ELECT 47MF 20% 16V
C119	1-101-005-00	CERAMIC 0.022MF 50V
C201	1-101-005-00	CERAMIC 0.022MF 50V
C202	1-101-005-00	CERAMIC 0.022MF 50V
C203	1-101-005-00	CERAMIC 0.022MF 50V
C204	1-162-211-31	CERAMIC 33PF 5% 50V
C205	1-123-380-00	ELECT 1MF 20% 50V
C206	1-101-005-00	CERAMIC 0.022MF 50V
C207	1-123-332-00	ELECT 47MF 20% 16V
C208	1-101-005-00	CERAMIC 0.022MF 50V
C209	1-101-005-00	CERAMIC 0.022MF 50V
C210	1-101-005-00	CERAMIC 0.022MF 50V
C211	1-101-005-00	CERAMIC 0.022MF 50V
C212	1-123-380-00	ELECT 1MF 20% 50V
C301	1-123-332-00	ELECT 47MF 20% 16V
C302	1-123-380-00	ELECT 1MF 20% 50V
C303	1-123-379-00	ELECT 0.47MF 20% 50V
C304	1-123-380-00	ELECT 1MF 20% 50V
C305	1-123-380-00	ELECT 1MF 20% 50V
C306	1-123-356-00	ELECT 10MF 20% 50V
C307	1-123-356-00	ELECT 10MF 20% 50V
C308	1-123-356-00	ELECT 10MF 20% 50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description
C309	1-162-294-31	CERAMIC 0.001MF 10% 50V
C310	1-162-294-31	CERAMIC 0.001MF 10% 50V
C311	1-123-380-00	ELECT 1MF 20% 50V
C312	1-123-380-00	ELECT 1MF 20% 50V
C313	1-162-305-31	CERAMIC 0.0068MF 20% 16V
C314	1-162-305-31	CERAMIC 0.0068MF 20% 16V
C315	1-162-305-31	CERAMIC 0.0068MF 20% 16V
C316	1-162-305-31	CERAMIC 0.0068MF 20% 16V
C317	1-162-305-31	CERAMIC 0.0068MF 20% 16V
C318	1-162-305-31	CERAMIC 0.0068MF 20% 16V
C319	1-130-491-00	MYLAR 0.047MF 5% 50V
C320	1-101-005-00	CERAMIC 0.022MF 50V
C401	1-162-294-31	CERAMIC 0.001MF 10% 50V
C402	1-101-005-00	CERAMIC 0.022MF 50V
C403	1-123-356-00	ELECT 10MF 20% 50V
C404	1-101-005-00	CERAMIC 0.022MF 50V
C405	1-101-005-00	CERAMIC 0.022MF 50V
C407	1-162-215-31	CERAMIC 47PF 5% 50V
C408	1-161-494-00	CERAMIC 0.022MF 30% 25V
C409	1-162-294-31	CERAMIC 0.001MF 10% 50V
C410	1-130-487-00	MYLAR 0.022MF 5% 50V
C411	1-101-005-00	CERAMIC 0.022MF 50V
C412	1-101-005-00	CERAMIC 0.022MF 50V
C413	1-162-306-31	CERAMIC 0.01MF 20% 16V
C414	1-101-005-00	CERAMIC 0.022MF 50V
C415	1-123-379-00	ELECT 0.47MF 20% 50V
C416	1-123-332-00	ELECT 47MF 20% 16V
C417	1-123-382-00	ELECT 3.3MF 20% 50V
C418	1-123-369-00	ELECT 4.7MF 20% 50V
C419	1-123-382-00	ELECT 3.3MF 20% 50V
C420	1-101-005-00	CERAMIC 0.022MF 50V
C421	1-162-306-31	CERAMIC 0.01MF 20% 16V
C422	1-161-494-00	CERAMIC 0.022MF 30% 25V
C423	1-101-005-00	CERAMIC 0.022MF 50V
C424	1-102-949-00	CERAMIC 12PF 5% 50V
C425	1-102-880-00	CERAMIC 15PF 5% 50V
C426	1-104-069-00	POLYSTYRENE 470PF 5% 50V
C427	1-101-005-00	CERAMIC 0.022MF 5% 50V
C428	1-102-803-00	CERAMIC 27PF 5% 50V
C429	1-103-741-00	STYROL 0.0047MF 5% 50V
C430	1-101-005-00	CERAMIC 0.022MF 5% 50V
C431	1-102-942-00	CERAMIC 5PF 5% 50V
C432	1-101-005-00	CERAMIC 0.022MF 50V
C433	1-101-005-00	CERAMIC 0.022MF 50V
C434	1-101-005-00	CERAMIC 0.022MF 50V
C440	1-102-754-00	CERAMIC 39PF 5% 50V
C441	1-101-005-00	CERAMIC 0.022MF 50V
C442	1-101-005-00	CERAMIC 0.022MF 50V
C443	1-101-005-00	CERAMIC 0.022MF 50V
C444	1-101-005-00	CERAMIC 0.022MF 50V
C445	1-101-005-00	CERAMIC 0.022MF 50V
C446	1-101-005-00	CERAMIC 0.022MF 50V
C447	1-123-381-00	ELECT 2.2MF 20% 50V
C448	1-123-380-00	ELECT 1MF 20% 50V
C449	1-123-380-00	ELECT 1MF 20% 50V
C501	1-101-005-00	CERAMIC 0.022MF 50V
C502	1-123-333-00	ELECT 100MF 20% 16V
C503	1-101-005-00	CERAMIC 0.022MF 50V
C504	1-123-307-00	ELECT 100MF 20% 10V
C505	1-101-005-00	CERAMIC 0.022MF 50V
C506	1-101-005-00	CERAMIC 0.022MF 50V
C601	1-101-005-00	CERAMIC 0.022MF 50V
C602	1-123-307-00	ELECT 100MF 20% 10V
C603	1-102-852-00	CERAMIC 47PF 5% 50V
C604	1-102-852-00	CERAMIC 47PF 5% 50V
C605	1-123-380-00	ELECT 1MF 20% 50V
C606	1-101-005-00	CERAMIC 0.022MF 50V
C607	1-162-306-31	CERAMIC 0.01MF 20% 16V
C608	1-101-005-00	CERAMIC 0.022MF 50V
C609	1-123-356-00	ELECT 10MF 20% 50V
C610	1-101-005-00	CERAMIC 0.022MF 50V
C611	1-123-332-00	ELECT 47MF 20% 16V
C612	1-136-171-00	FILM 0.33MF 5% 50V
C613	1-130-487-00	MYLAR 0.022MF 5% 50V
C614	1-123-609-00	ELECT 0.33MF 20% 50V
C615	1-136-171-00	FILM 0.33MF 5% 50V
C616	1-130-487-00	MYLAR 0.022MF 5% 50V
C617	1-123-607-00	ELECT 0.1MF 20% 50V
C630	1-162-294-31	CERAMIC 0.001MF 10% 50V
C631	1-101-005-00	CERAMIC 0.022MF 50V
C632	1-101-005-00	CERAMIC 0.022MF 50V
C633	1-101-005-00	CERAMIC 0.022MF 50V
C634	1-161-494-00	CERAMIC 0.022MF 30% 25V
C635	1-101-006-00	CERAMIC 0.047MF 50V
CF201	1-527-968-00	FILTER, CERAMIC
CF202	1-527-968-00	FILTER, CERAMIC
CF401	1-527-937-00	FILTER, CERAMIC
CF402	1-527-981-00	FILTER, CERAMIC
CNJ101*1-562-327-00		SOCKET, CONNECTOR 3P
CNJ201*1-560-060-00		PIN, CONNECTOR 2P (NULL CHECK POINT)

ELECTRICAL PARTS			ELECTRICAL PARTS				
Ref.No.	Part No.	Description	Ref.No.	Part No.	Description		
L105	*1-459-396-00	COIL (WITH CORE)	R113	1-247-893-00	CARBON	390K	5% 1/6W
L301	1-408-924-00	MICRO INDUCTOR 10MMH	R114	1-249-405-11	CARBON	100	5% 1/6W
L302	1-408-924-00	MICRO INDUCTOR 10MMH	R115	1-247-799-00	CARBON	47	5% 1/4W F
L401	1-402-152-11	ANTENNA, FERRITE-ROD (MW)	R201	1-247-901-00	CARBON	820K	5% 1/6W
L402	1-406-089-11	COIL (OSC)	R202	1-247-819-00	CARBON	330	5% 1/6W
L403	1-405-955-00	COIL (OSC)	R203	1-247-819-00	CARBON	330	5% 1/6W
L404	1-406-106-11	COIL (OSC) SW2	R204	1-247-873-00	CARBON	56K	5% 1/6W
L405	1-401-910-00	COIL (ANT)	R205	1-247-831-00	CARBON	1K	5% 1/6W
L406	1-401-985-00	COIL (ANT)	R206	1-247-859-00	CARBON	15K	5% 1/6W
L407	1-408-202-00	MICRO INDUCTOR 390UH	R207	1-249-433-11	CARBON	22K	5% 1/6W
L408	1-408-202-00	MICRO INDUCTOR 390UH	R208	1-247-799-00	CARBON	47	5% 1/4W
L409	1-408-196-00	MICRO INDUCTOR 120UH	R209	1-247-859-00	CARBON	15K	5% 1/6W
L410	1-408-202-00	MICRO INDUCTOR 390UH	R210	1-249-441-11	CARBON	100K	5% 1/6W
L411	1-408-202-00	MICRO INDUCTOR 390UH	R211	1-249-429-11	CARBON	10K	5% 1/6W
L412	1-408-202-00	MICRO INDUCTOR 390UH	R301	1-247-799-00	CARBON	47	5% 1/6W
L413	1-408-551-00	MICRO INDUCTOR 1UH	R302	1-249-423-00	CARBON	3.3K	5% 1/6W
L414	1-408-202-00	MICRO INDUCTOR 390UH	R303	1-249-435-11	CARBON	33K	5% 1/6W
LCD1	1-806-874-11	INDICATOR, L-CRYSTAL LT5056	R304	1-247-833-00	CARBON	1.2K	5% 1/6W
PL501	1-518-511-21	LAMP, PILOT, YELLOW	R305	1-249-437-11	CARBON	47K	5% 1/6W
Q101	8-729-353-52	TRANSISTOR 2SC535	R306	1-249-437-11	CARBON	47K	5% 1/6W
Q102	8-729-353-52	TRANSISTOR 2SC535	R307	1-249-419-11	CARBON	1.5K	5% 1/6W
Q103	8-729-672-42	TRANSISTOR 2SC2724-C	R308	1-249-419-11	CARBON	1.5K	5% 1/6W
Q104	8-729-672-42	TRANSISTOR 2SC2724-C	R309	1-249-429-11	CARBON	10K	5% 1/6W
Q201	8-729-672-42	TRANSISTOR 2SC2724-C	R310	1-249-429-11	CARBON	10K	5% 1/6W
Q301	8-729-606-33	TRANSISTOR 2SC2603-F	R312	1-249-437-11	CARBON	47K	5% 1/6W
Q302	8-729-606-33	TRANSISTOR 2SC2603-F	R313	1-247-831-00	CARBON	1K	5% 1/6W
Q303	8-729-900-63	TRANSISTOR DTA124ES	R314	1-249-437-11	CARBON	47K	5% 1/6W
Q304	8-729-900-36	TRANSISTOR DTC124ES	R316	1-249-437-11	CARBON	47K	5% 1/6W
Q305	8-729-900-36	TRANSISTOR DTC124ES	R319	1-249-437-11	CARBON	47K	5% 1/6W
Q401	8-729-606-33	TRANSISTOR 2SC2603-F	R320	1-249-437-11	CARBON	47K	5% 1/6W
Q501	8-729-288-02	TRANSISTOR 2SD880	R322	1-249-437-11	CARBON	47K	5% 1/6W
Q502	8-729-224-61	TRANSISTOR 2SK246-Y	R330	1-247-853-00	CARBON	8.2K	5% 1/6W
Q601	8-729-201-56	TRANSISTOR 2SK246-GR2	R401	1-249-421-11	CARBON	2.2K	5% 1/6W
Q602	8-729-606-33	TRANSISTOR 2SC2603-F	R402	1-249-405-11	CARBON	100	5% 1/6W
Q603	8-729-201-56	TRANSISTOR 2SK246-GR2	R403	1-247-825-00	CARBON	560	5% 1/6W
Q604	8-729-606-33	TRANSISTOR 2SC2603-F	R404	1-249-423-00	CARBON	3.3K	5% 1/6W
Q605	8-729-900-36	TRANSISTOR DTC124ES	R405	1-247-799-00	CARBON	47	5% 1/6W
Q606	8-729-900-63	TRANSISTOR DTA124ES	R406	1-249-429-11	CARBON	10K	5% 1/6W
Q607	8-729-900-63	TRANSISTOR DTA124ES	R407	1-249-405-11	CARBON	100	5% 1/6W
Q608	8-729-900-36	TRANSISTOR DTC124ES	R408	1-249-429-11	CARBON	10K	5% 1/6W
Q609	8-729-900-63	TRANSISTOR DTA124ES	R409	1-247-811-00	CARBON	150	5% 1/6W
Q610	8-729-900-36	TRANSISTOR DTC124ES	R410	1-249-429-11	CARBON	10K	5% 1/6W
Q611	8-729-900-63	TRANSISTOR DTA124ES	R411	1-249-429-11	CARBON	10K	5% 1/6W
Q612	8-729-900-36	TRANSISTOR DTC124ES	R412	1-247-859-00	CARBON	15K	5% 1/6W
Q613	8-729-900-63	TRANSISTOR DTA124ES	R413	1-249-433-11	CARBON	22K	5% 1/6W
Q614	8-729-606-33	TRANSISTOR 2SC2603-F	R414	1-249-429-11	CARBON	10K	5% 1/6W
Q615	8-729-900-36	TRANSISTOR DTC124ES	R415	1-249-429-11	CARBON	10K	5% 1/6W
R101	1-249-441-11	CARBON 100K 5% 1/6W	R418	1-247-857-00	CARBON	12K	5% 1/6W
R102	1-247-901-00	CARBON 820K 5% 1/6W	R419	1-249-429-11	CARBON	10K	5% 1/6W
R103	1-249-405-11	CARBON 100 5% 1/6W	R420	1-249-429-11	CARBON	10K	5% 1/6W
R104	1-249-405-11	CARBON 100 5% 1/6W	R421	1-247-857-00	CARBON	12K	5% 1/6W
R105	1-249-441-11	CARBON 100K 5% 1/6W	R422	1-247-851-00	CARBON	6.8K	5% 1/6W
R106	1-247-901-00	CARBON 820K 5% 1/6W	R423	1-247-825-00	CARBON	560	5% 1/6W
R107	1-247-819-00	CARBON 330 5% 1/6W	R424	1-247-857-00	CARBON	12K	5% 1/6W
R108	1-247-795-00	CARBON 33 5% 1/6W	R425	1-247-857-00	CARBON	12K	5% 1/6W
R109	1-249-405-11	CARBON 100 5% 1/6W	R426	1-247-857-00	CARBON	12K	5% 1/6W
R110	1-247-893-00	CARBON 390K 5% 1/6W	R427	1-247-857-00	CARBON	12K	5% 1/6W
R111	1-249-425-11	CARBON 4.7K 5% 1/6W					
R112	1-247-859-00	CARBON 15K 5% 1/6W					

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R428	1-247-857-00	CARBON	12K	5%	1/6W
R429	1-247-857-00	CARBON	12K	5%	1/6W
R430	1-247-857-00	CARBON	12K	5%	1/6W
R431	1-247-857-00	CARBON	12K	5%	1/6W
R439	1-249-429-11	CARBON	10K	5%	1/6W
R440	1-247-857-00	CARBON	12K	5%	1/6W
R441	1-247-879-00	CARBON	100K	5%	1/6W
R501	1-247-815-00	CARBON	220	5%	1/6W
R502	1-247-823-00	CARBON	470	5%	1/6W
R503	1-247-775-00	CARBON	4.7	5%	1/6W
R504	1-247-831-00	CARBON	1K	5%	1/6W
R601	1-249-425-11	CARBON	4.7K	5%	1/6W
R602	1-249-441-11	CARBON	100K	5%	1/6W
R603	1-249-435-11	CARBON	33K	5%	1/6W
R604	1-249-423-11	CARBON	3.3K	5%	1/6W
R605	1-249-441-11	CARBON	100K	5%	1/6W
R606	1-249-435-11	CARBON	33K	5%	1/6W
R607	1-247-797-00	CARBON	39	5%	1/6W
R608	1-247-799-00	CARBON	47	5%	1/6W
R609	1-249-437-11	CARBON	47K	5%	1/6W
R610	1-247-817-00	CARBON	270	5%	1/6W
R611	1-247-829-00	CARBON	820	5%	1/6W
R612	1-247-825-00	CARBON	560	5%	1/6W
R613	1-249-435-11	CARBON	33K	5%	1/6W
R614	1-249-421-11	CARBON	2.2K	5%	1/6W
R615	1-249-425-11	CARBON	4.7K	5%	1/6W
R616	1-249-425-11	CARBON	4.7K	5%	1/6W
R617	1-249-437-11	CARBON	47K	5%	1/6W
R618	1-247-817-00	CARBON	270	5%	1/6W
R619	1-247-829-00	CARBON	820	5%	1/6W
R620	1-247-825-00	CARBON	560	5%	1/6W
R621	1-249-435-11	CARBON	33K	5%	1/6W
R622	1-249-421-11	CARBON	2.2K	5%	1/6W
R623	1-249-425-11	CARBON	4.7K	5%	1/6W
R624	1-249-425-11	CARBON	4.7K	5%	1/6W
R625	1-247-891-00	CARBON	330K	5%	1/6W
R640	1-249-435-11	CARBON	33K	5%	1/6W
R643	1-249-441-11	CARBON	100K	5%	1/6W
R644	1-249-425-11	CARBON	4.7K	5%	1/6W
RV201	1-228-997-00	RES, ADJ, CARBON	100K		
RV301	1-228-998-00	RES, ADJ, CARBON	220K		

ELECTRICAL PARTS

Ref.No.	Part No.	Description
S701	1-554-303-21	SWITCH, KEY BOARD (BAND)
S702	1-554-303-21	SWITCH, KEY BOARD (STEREO MUTING)
S703	1-554-303-21	SWITCH, KEY BOARD (MEMORY)
S704	1-554-303-21	SWITCH, KEY BOARD (TUNING -)
S705	1-554-303-21	SWITCH, KEY BOARD (TUNING +)
S706	1-554-303-21	SWITCH, KEY BOARD (PRESET 1)
S707	1-554-303-21	SWITCH, KEY BOARD (PRESET 2)
S708	1-554-303-21	SWITCH, KEY BOARD (PRESET 3)
S709	1-554-303-21	SWITCH, KEY BOARD (PRESET 4)
S710	1-554-303-21	SWITCH, KEY BOARD (PRESET 5)
T201	1-404-419-00	COIL, DISCRIMINATOR
T401	1-404-535-11	COIL (WITH IFT)
TM101	1-536-901-11	TERMINAL BOARD 3P (ANTENNA)
X301	1-567-250-11	OSCILLATOR, CERAMIC
X601	1-567-125-00	VIBRATOR, CRYSTAL

INTEGRATED STEREO AMPLIFIER

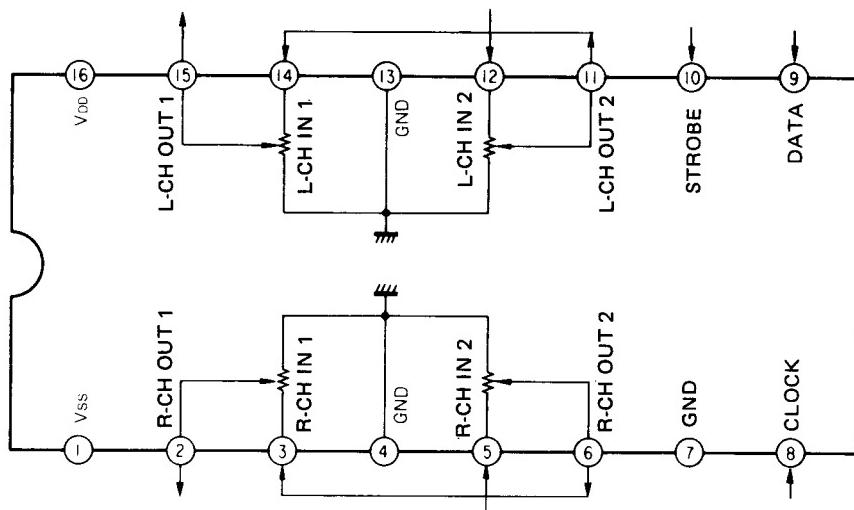
[TA-177R]

Note: TA-177R is an integrated stereo amplifier unit in FH-150R.

1. IC'S OPERATION

1-1. TC9176P (IC203)

TC9176P is an IC served as electronic volume.
This IC is capable of controlling the attenuation
from 0 dB to -76 dB at intervals of 2 dB.



● Pin Functions

- (2) R-CH OUT 1, (15) L-CH OUT 1
Output pin for 10 dB step attenuator.
The signal applied to L/R-CH IN 1 attenuates 8
steps from 0 to -70 dB at intervals of 10 dB.

- (3) R-CH IN 1, (14) L-CH IN 1
Input pin for 10 dB step attenuator.

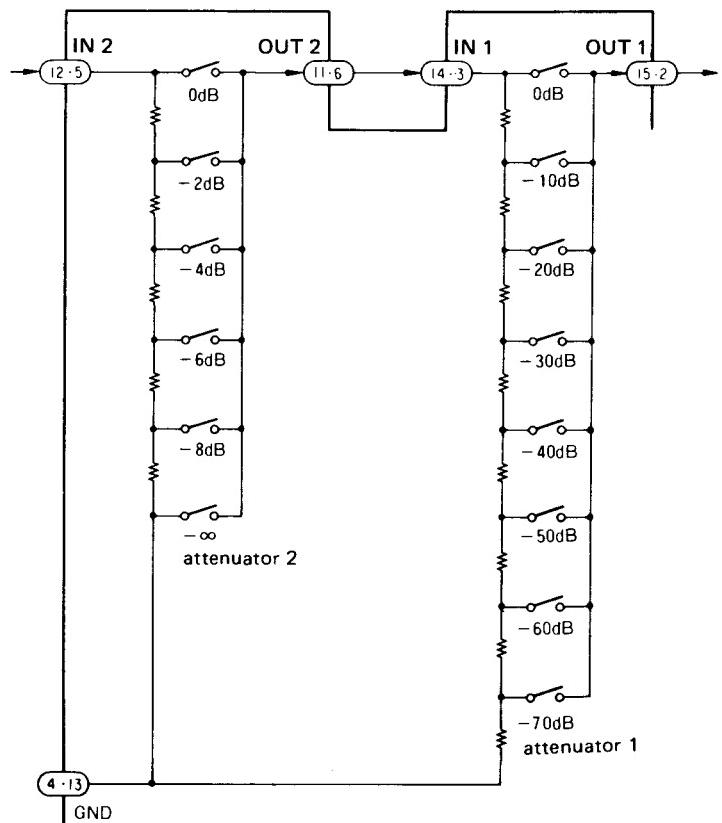
- (6) R-CH OUT 2, (11) L-CH OUT 2
Output pin for 2 dB step attenuator.
The signal applied to L/R-CH IN 2 attenuates 5
steps from 0 to -8 dB at intervals of 2 dB.

- (5) R-CH IN 2, (12) L-CH IN 2
Input pin for 2 dB step attenuator.

The attenuator is composed of the resistors and
the analog switches.

Attenuator 1 attenuates 10 dB steps from 0 to
-70 dB and attenuator 2 attenuates 2 dB steps
from 0 to 8 dB.

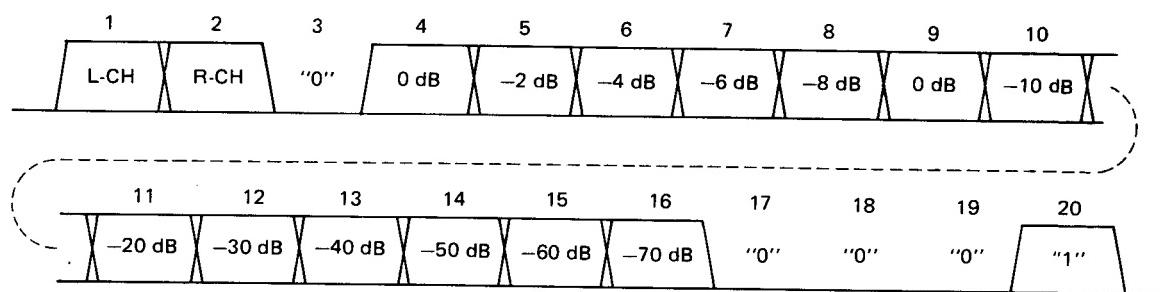
Total attenuation is 2 dB steps from 0 to -76 dB.



⑨ DATA

This pin is input the serial data from IC301.

Data contain attenuation value and selection of L-CH or R-CH, and these are composed of 20 bits.



⑧ CLOCK

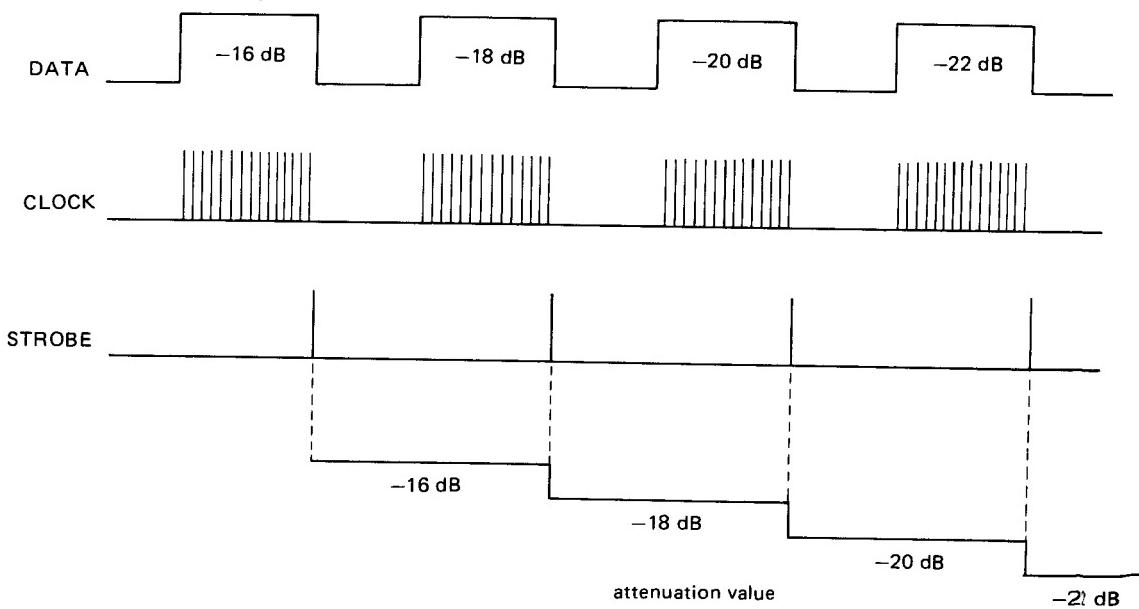
This pin is input the clock signal.

Data are input to the pin ⑨ that is synchronized by clock signal.

⑩ STROBE

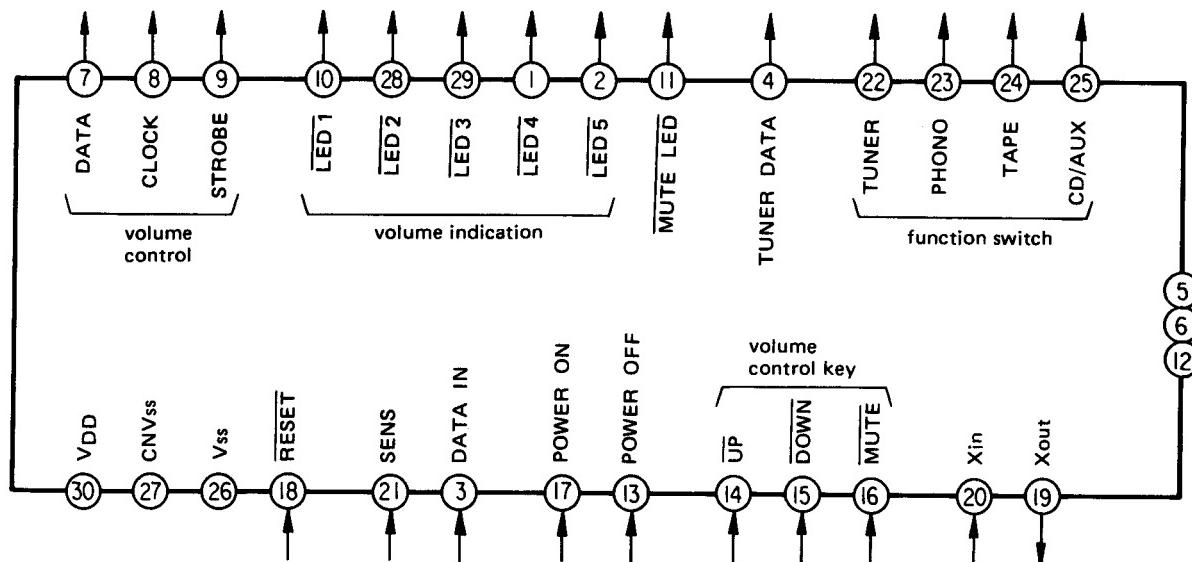
This pin is input the strobe pulse.

Data are latched, when strobe pulse is input to pin ⑩.

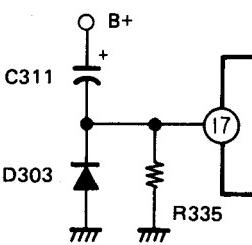
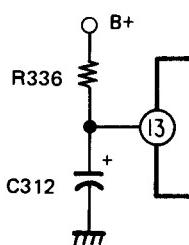


1-2. M50765-440SP (IC301)

M50765-440SP decodes the serial data of remote controller and feeds the volume control data to IC203.



● Pin Functions

Pin Number	Pin Name	I/O	Function
3	DATA IN	Input	This pin is input the serial data of remote controller.
21	SENS	Input	Input pin for starting transmission of the remote controller data. Input data (3) DATA is read at the beginning of the signal input to this pin.
17 13	POWER ON POWER OFF	Input Input	When power is turned on, pin (17) is input high level pulse from differential circuit and IC will be in standby mode. Second, pin (13) goes high level by integrating circuit and IC will be started.
			  <p>After power is turned off, (13) pin goes low level by integrating circuit and IC detects power off. IC's data (volume data) are kept by back-up battery.</p>
14 15	UP DOWN	Input Input	Input pin for volume control. When the signal is applied to these pins, (7) DATA, (8) CLOCK and (9) STROBE output the volume control data to IC203.
16	MUTE	Input	Input pin for switching MUTING -20 dB on/off.
22	TUNER	Output	Output pin for switching the mode to TUNER. When (3) DATA IN inputs the data of TUNER, this pin goes high.

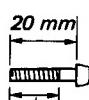
Pin Number	Pin Name	I/O	Function																																															
23	PHONO	Output	Output pin for switching the mode to PHONO. When (3) DATA IN inputs the data of PHONO, this pin goes high.																																															
24	TAPE	Output	Output pin for switching the mode to TAPE. When (3) DATA IN inputs the data of TAPE, this goes high.																																															
25	CD/AUX	Output	Output pin for switching the mode to CD/AUX. When (3) DATA IN inputs the data of CD/AUX, this pin goes high.																																															
11	MUTE LED	Output	Output pin for switching the MUTING -20 dB LED on/off.																																															
10 28 29 1 2	LED 1 LED 2 LED 3 LED 4 LED 5	Output	Output pin for indicating the volume level. These pins output signal that cope with volume level. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">Volume level (dB)</th> <th colspan="5">Pin</th> </tr> <tr> <th>(10)</th> <th>(28)</th> <th>(29)</th> <th>(1)</th> <th>(2)</th> </tr> </thead> <tbody> <tr> <td>0 to -2</td> <td>L</td> <td>L</td> <td>L</td> <td>L</td> <td>L</td> </tr> <tr> <td>-4 to -6</td> <td>L</td> <td>L</td> <td>L</td> <td>L</td> <td>H</td> </tr> <tr> <td>-8 to -18</td> <td>L</td> <td>L</td> <td>L</td> <td>H</td> <td>H</td> </tr> <tr> <td>-20 to -34</td> <td>L</td> <td>L</td> <td>H</td> <td>H</td> <td>H</td> </tr> <tr> <td>-36 to -76</td> <td>L</td> <td>H</td> <td>H</td> <td>H</td> <td>H</td> </tr> <tr> <td>-78 to -∞</td> <td>H</td> <td>H</td> <td>H</td> <td>H</td> <td>H</td> </tr> </tbody> </table> H: high level L: low level	Volume level (dB)	Pin					(10)	(28)	(29)	(1)	(2)	0 to -2	L	L	L	L	L	-4 to -6	L	L	L	L	H	-8 to -18	L	L	L	H	H	-20 to -34	L	L	H	H	H	-36 to -76	L	H	H	H	H	-78 to -∞	H	H	H	H	H
Volume level (dB)	Pin																																																	
	(10)	(28)	(29)	(1)	(2)																																													
0 to -2	L	L	L	L	L																																													
-4 to -6	L	L	L	L	H																																													
-8 to -18	L	L	L	H	H																																													
-20 to -34	L	L	H	H	H																																													
-36 to -76	L	H	H	H	H																																													
-78 to -∞	H	H	H	H	H																																													
4	TUNER DATA	Output	This pin outputs the receiving band/station switching signal. That signal feeds to tuner unit (ST-177R).																																															
7	DATA	Output	This pin outputs the volume control data to IC203.																																															
8	CLOCK	Output	This pin outputs the clock signal of volume control data.																																															
9	STROBE	Output	This pin outputs the strobe signal of volume control data.																																															

2. SERVICING NOTE (G-AEP model only)

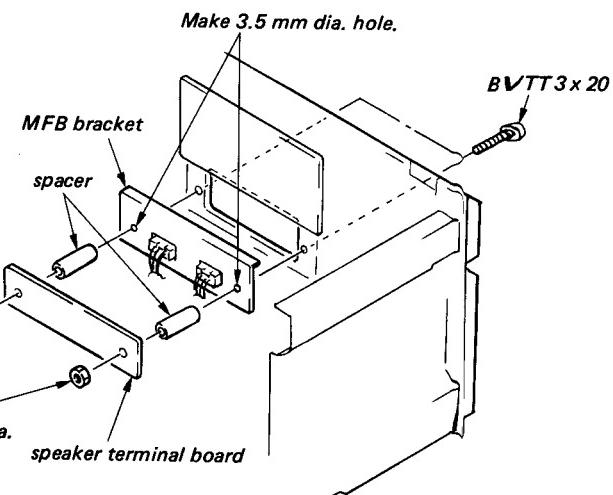
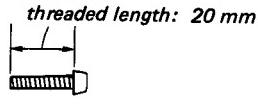
- Caution on replacing screws fixing speaker terminal board.

Two types (A), (B) of screw (BVTT3 x 20) is supplied as repair part for speaker terminal board fixing. If (A) type screw is supplied, make a hole as shown in the figure.

(A) type screw



(B) type screw

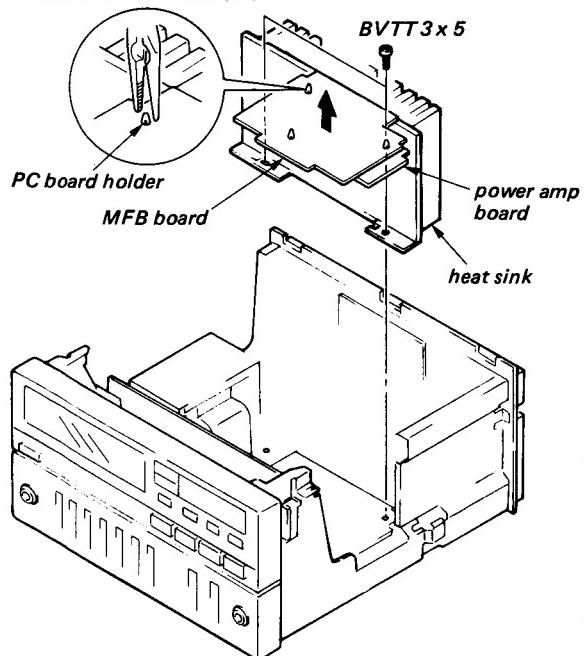


3. DISASSEMBLY

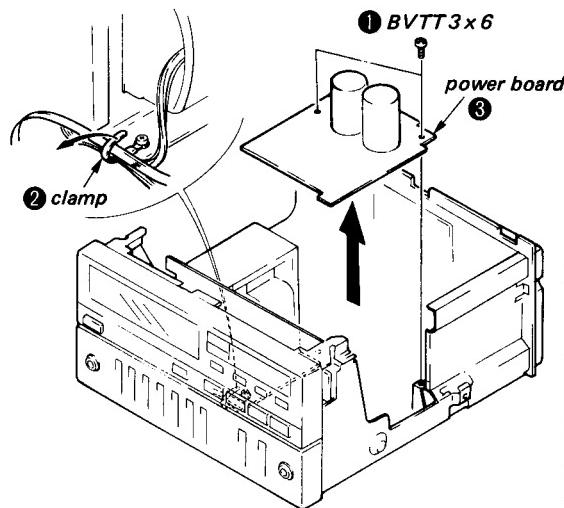
Note: Follow the disassembly procedure in the numerical order given.

MFB BOARD/POWER AMP BOARD

Unlock the MFB board from the PC board holder.

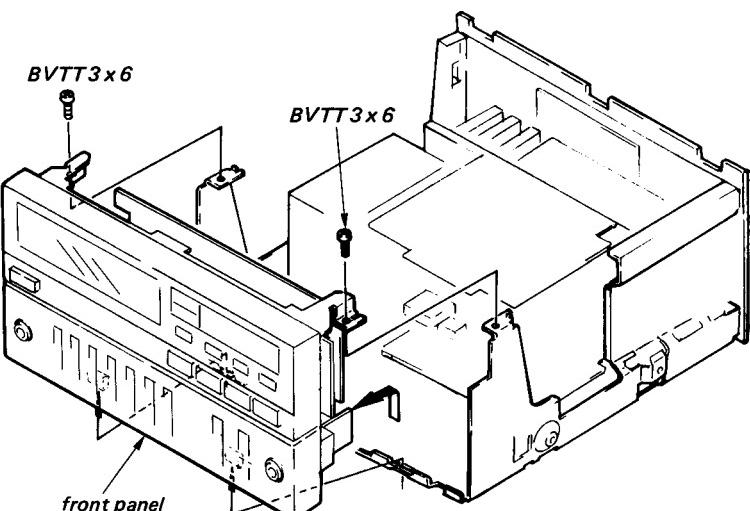


POWER BOARD

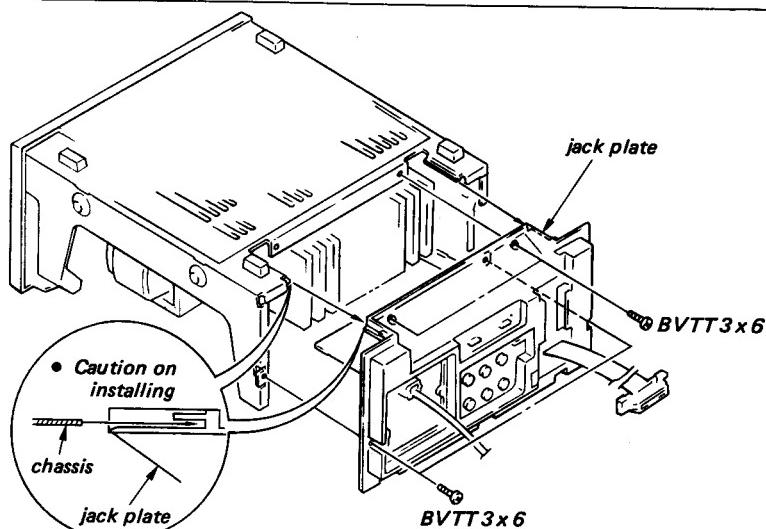


- Remove the case.
(four screws)

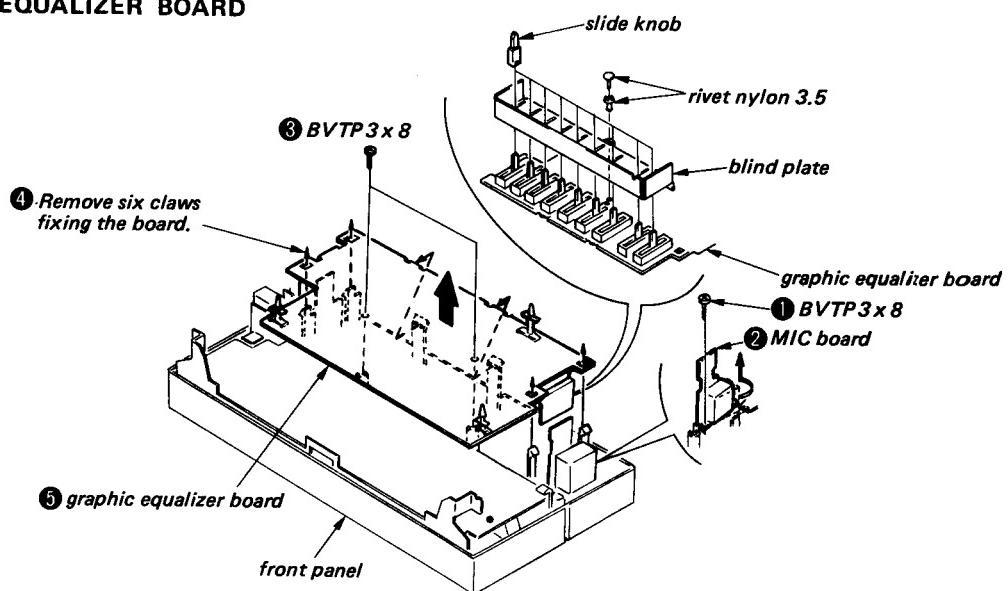
FRONT PANEL



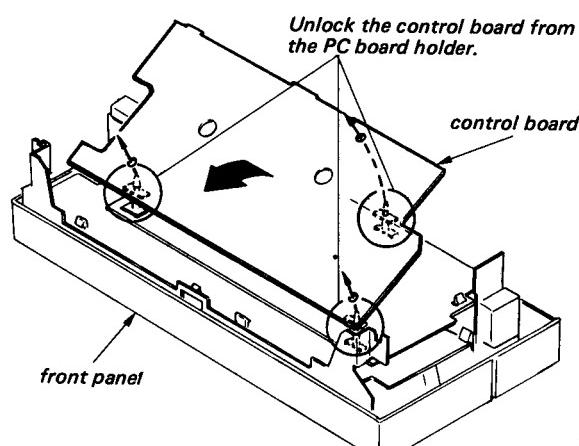
JACK PLATE



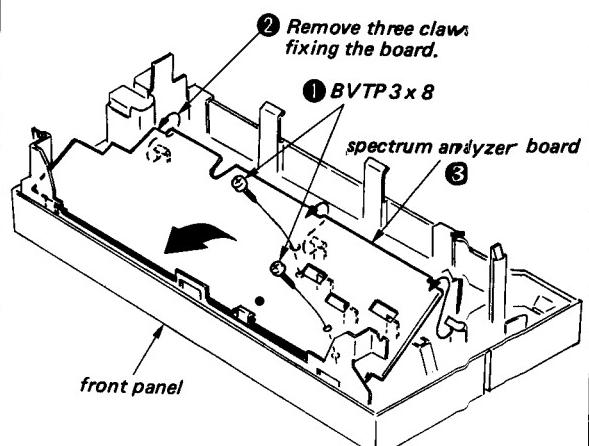
GRAPHIC EQUALIZER BOARD



CONTROL BOARD



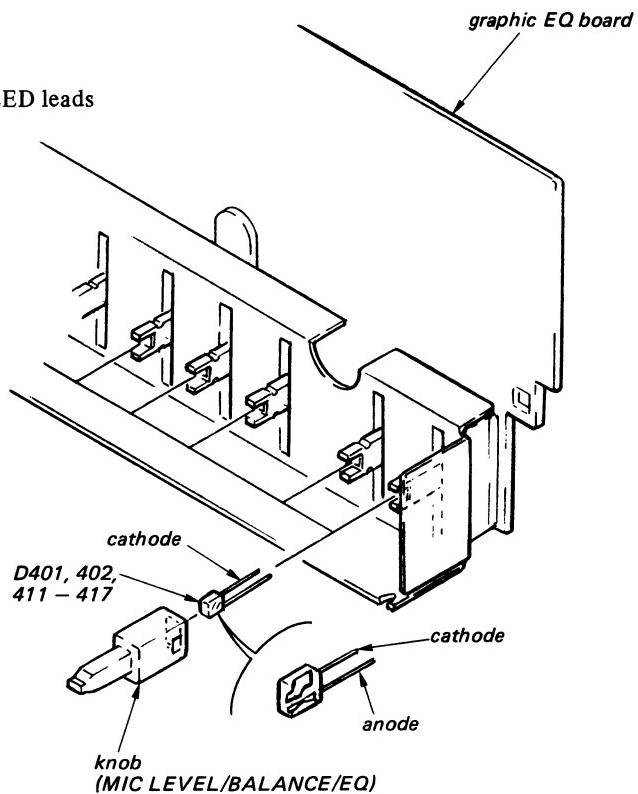
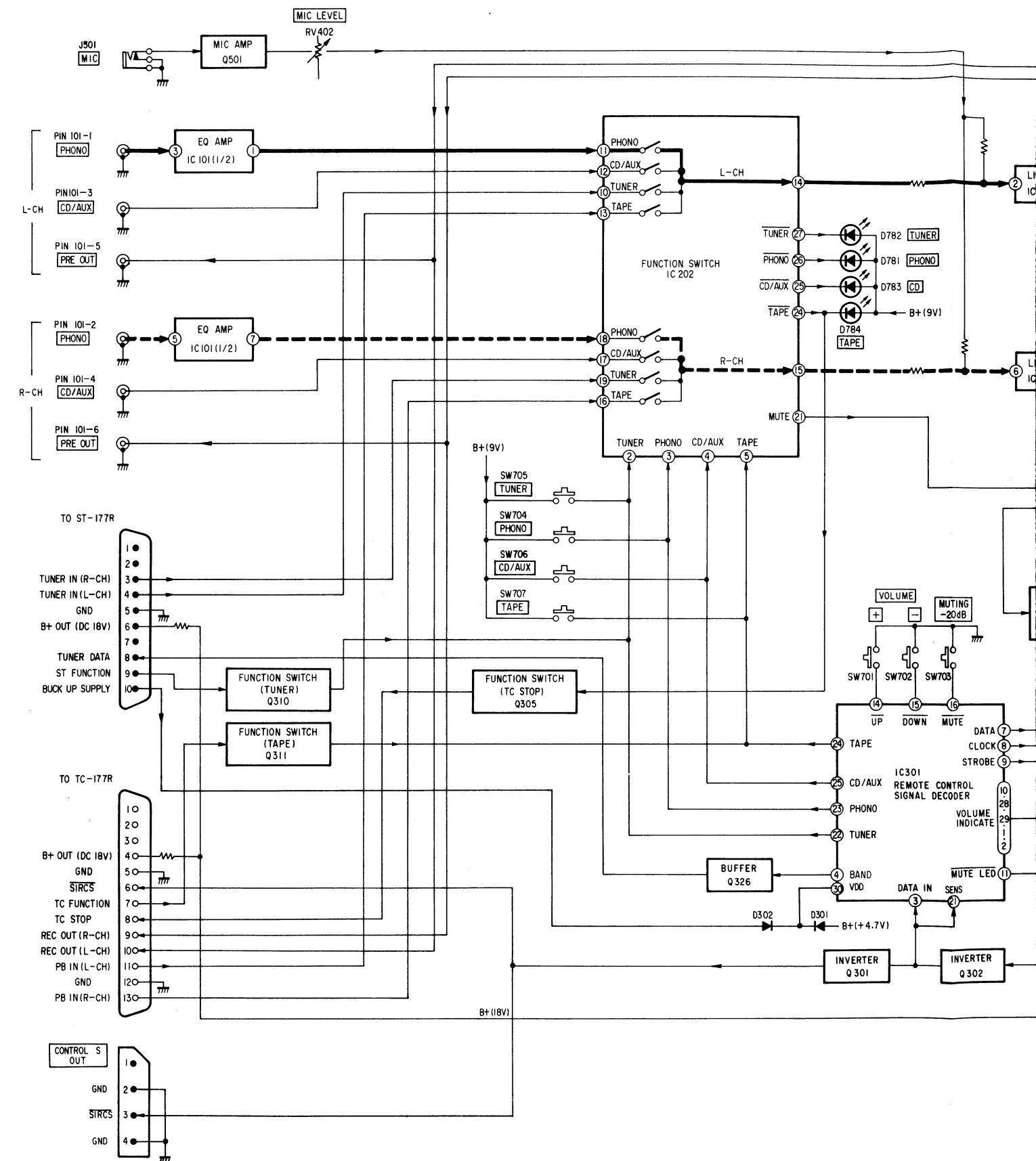
SPECTRUM ANALYZER BOARD

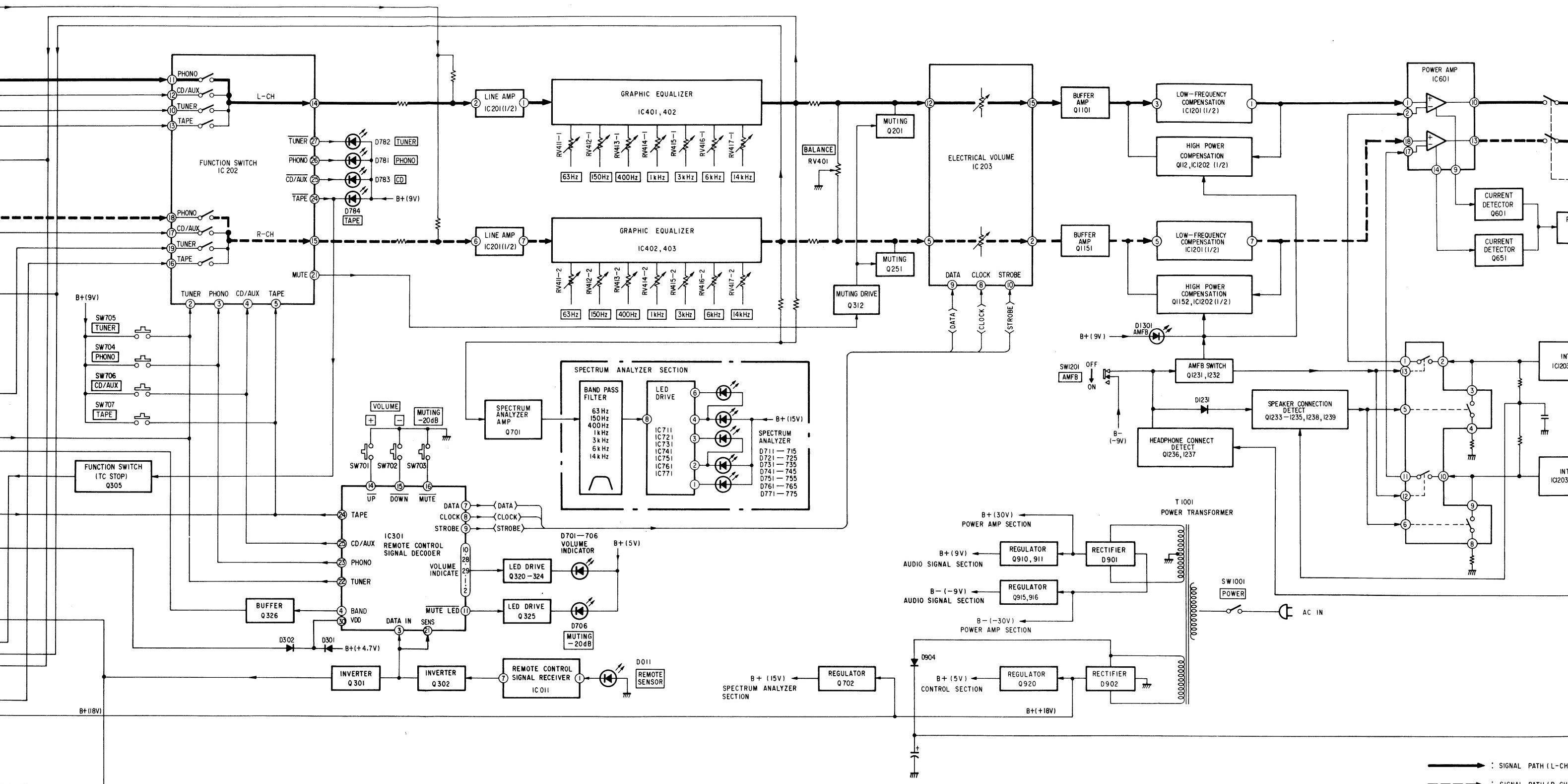


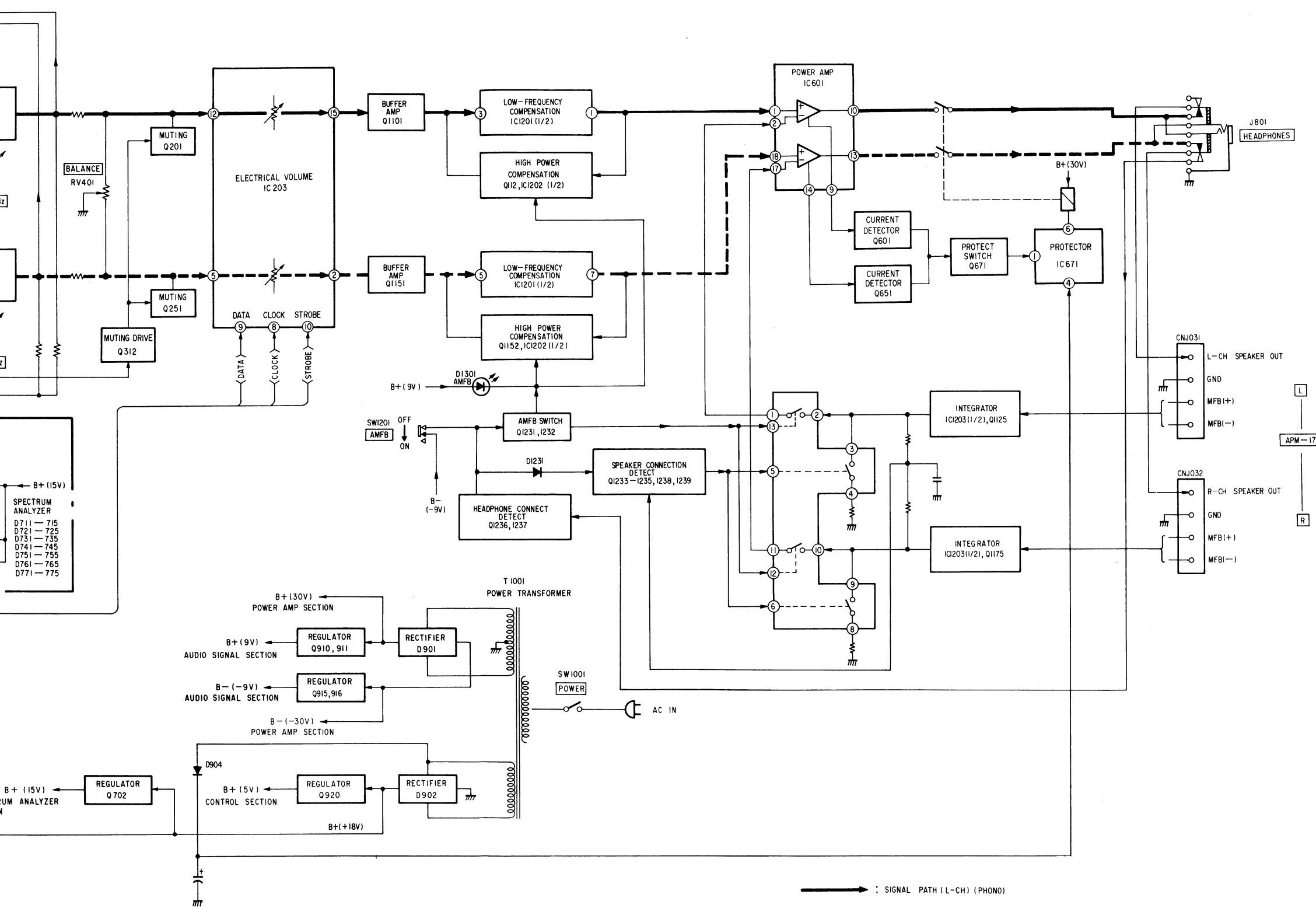
LEDs OF D401, 402, 411 – 417 REPLACEMENT

Though LEDs of D401, 402, 411 – 417 are built in each variable resistor RV401, 402, 411 – 417, only LEDs can be replaced.

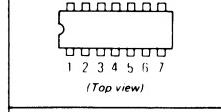
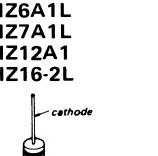
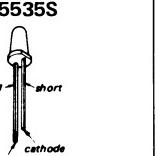
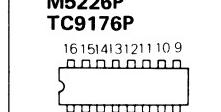
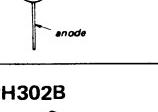
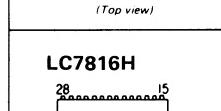
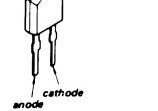
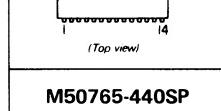
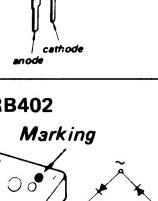
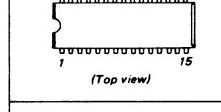
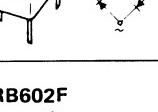
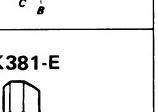
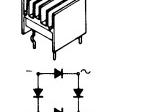
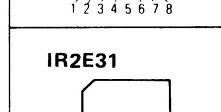
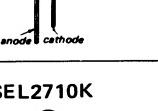
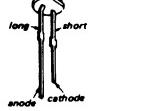
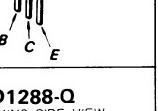
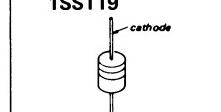
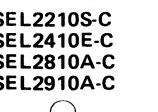
1. Pull out the knobs, and pull out LED.
2. Cut the new LED leads as long as the LED leads mounted previously.

**4. BLOCK DIAGRAM**





● Semiconductor Lead Layouts

LC4966 1413121110 9 8  (Top view)	HZ6A1L HZ7A1L HZ12A1 HZ16-2L 	AA5535S 
M5226P TC9176P 16151413121110 9  (Top view)	2SC1841-PA 	
PH302B  (Top view)	LC7816H 28  (Top view)	
RB402 Marking  (Top view)	2SC634SP 2SC2603F DTA144WS DTC144WS 	
M50765-440SP 30  (Top view)	RB602F  (Top view)	2SK381-E 
CX20106A M5218L μPC1237H  (Top view)	2SD809  letter side	
IR2E31  (Top view)	LN450YP  anode cathode	
STK4152II  (Top view)	SEL2710K  long short anode cathode	
SEL2210S-C SEL2410E-C SEL2810A-C SEL2910A-C  MARKING SIDE VIEW	2SD1288-Q  B C E	
1SS119  anode cathode	2SA1175  long short anode cathode	

5. MOUNTING DIAGRAM

- Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
IC011	J-4	Q325	H-13	D321	G-10	D745	H-8
IC101	D-17	Q326	H-12	D401	D-2	D751	G-7
IC201	H-11	Q501	B-3	D402	C-2	D752	G-7
IC202	G-10	Q601	C-22	D411	I-3	D753	G-7
IC203	I-11	Q651	D-21	D412	H-3	D754	G-7
IC301	I-13	Q671	D-22	D413	G-3	D755	G-8
IC401	G-4	Q701	I-6	D414	G-2	D761	G-6
IC402	F-4	Q702	E-6	D415	F-3	D762	G-7
IC403	E-4	Q910	I-24	D416	E-2	D763	G-7
IC601	B-22	Q911	I-23	D417	E-3	D764	G-7
IC671	C-23	Q915	H-22	D671	C-23	D765	G-8
IC711	I-8	Q916	H-22	D701	F7	D771	F-7
IC721	H-8	Q920	H-21	D702	F-7	D772	F-7
IC731	H-8	Q1101	H-19	D703	F-7	D773	F-7
IC741	G-8	Q1102	I-18	D704	F-7	D774	F-7
IC751	G-8	Q1125	G-16	D705	E-8	D775	F-8
IC761	F-8	Q1151	H-20	D706	E-8	D781	C-6
IC771	F-8	Q1152	G-19	D711	I-7	D782	D-6
IC1201	G-18	Q1175	E-16	D712	I-7	D783	D-6
IC1202	F-18	Q1231	I-16	D713	I-7	D784	E-6
IC1203	F-18	Q1232	I-17	D714	I-7	D791	E-6
IC1204	G-15	Q1233	H-16	D715	I-8	D901	J-22
		Q1234	H-15	D721	I-7	D902	I-21
Q201	H-11	Q1235	I-16	D722	I-7	D904	I-21
Q251	I-12	Q1236	I-15	D723	I-7	D910	J-23
Q301	E-13	Q1237	H-15	D724	I-7	D915	I-22
Q302	J-12	Q1238	I-16	D725	I-8	D920	H-21
Q305	F-12	Q1239	I-16	D731	H-7	D1101	I-18
Q310	D-13			D732	H-7	D1102	I-17
Q311	D-13	D011	J-5	D733	H-7	D1125	F-18
Q312	G-10	D301	E-12	D734	H-7	D1151	G-19
Q320	H-13	D302	D-13	D735	H-8	D1152	G-19
Q321	H-13	D303	J-13	D741	H-7	D1175	F-18
Q322	H-13	D304	F-10	D742	H-7	D1231	I-15
Q323	G-12	D311	F-13	D743	H-7	D1232	I-15
Q324	H-12	D312	H-10	D744	H-7	D1301	J-15

Note:
EA3: Saudi Arabia model
AED: DENMARK model

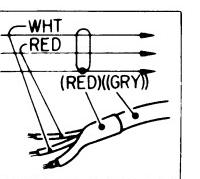
Note: SCHEMATIC DIAGRAM

- All capacitors are in μF unless otherwise noted. pF: $\mu\mu\text{F}$ 50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
 - : signal path.
 - Components for right channel have same values as for left channel. Reference numbers are coded from 150, 250, 450, 650, 1150.
 - WW— : nonflammable resistor.
 - WWWW— : fusible resistor.
 - : B+ bus.
 - — : B- bus.
 - Voltages are dc with respect to ground unless otherwise noted.
 - Readings are taken under no-signal conditions with a VOM (50 k Ω /V).
 - no mark: Not connecting speaker.
 - < > : When inserting headphone plug into HEAD-PHONES JACK.
 - () : When AMFB switch is off connecting APM-177M speaker or a load resistor (1k – 1.5k) with speaker terminal.
 - (()) : When AMFB switch is ON connecting APM-177M speaker or a load resistor (1k – 1.5k) with speaker terminal.
 - Voltage variations may be noted due to normal production tolerances.
 - Waveforms are taken to ground in no-signal mode by using oscilloscope.
 - Voltage variations may be noted due to normal production tolerances.
 - Switches

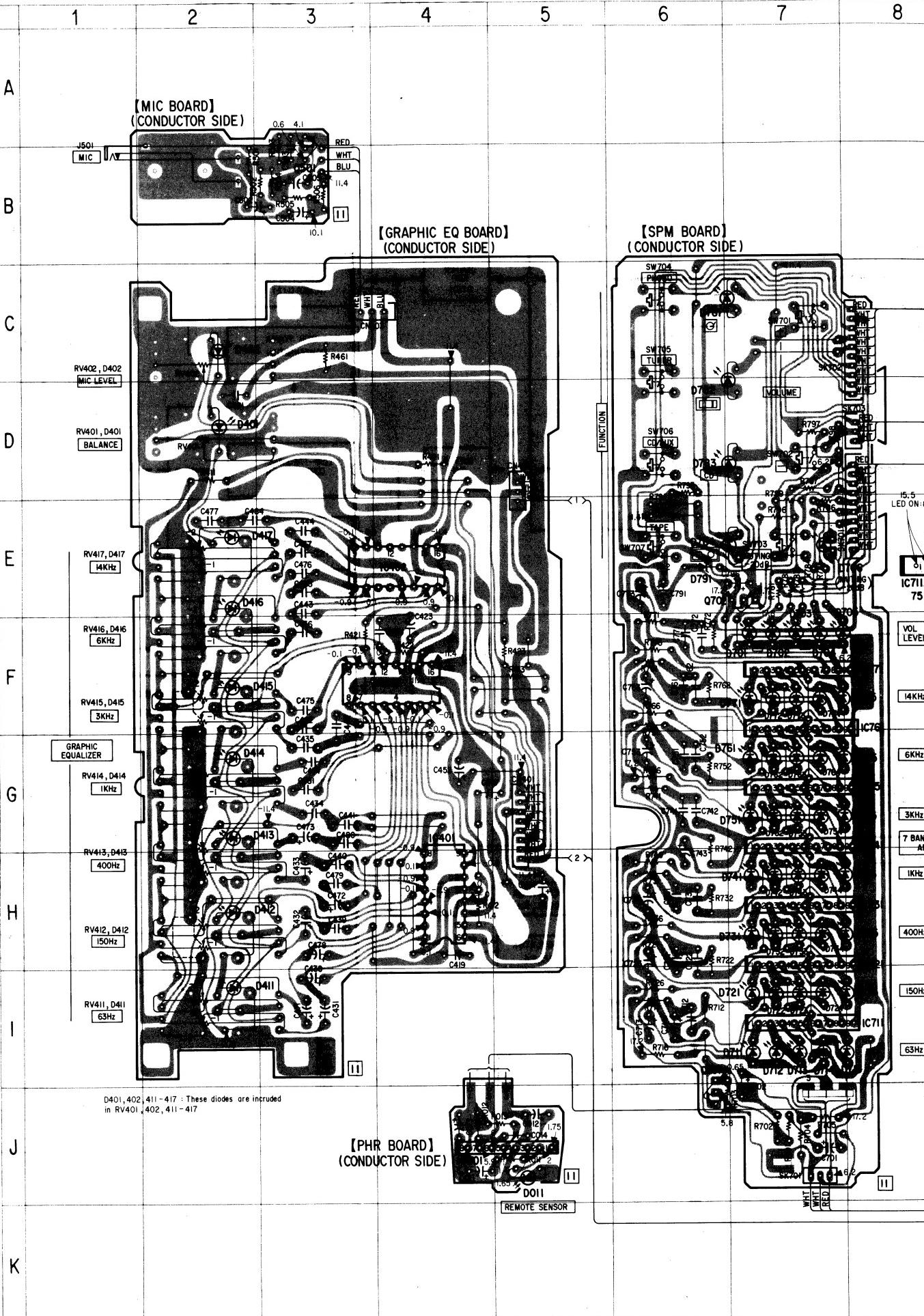
Ref. No.	Switch	Position
SW701	VOLUME UP	OFF
SW702	VOLUME DOWN	OFF
SW703	MUTING -20 dB	OFF
SW704	PHONO	OFF
SW705	TUNER	OFF
SW706	CD/AUX	OFF
SW707	TAPE	OFF
SW1001	POWER	OFF
SW1002	VOLTAGE SELECTOR (E, EA3 model only)	240 V
SW1201	AM/FB	OFF

Note: MOUNTING DIAGRAM

- Color code of sleeveing over the end of the jacket.



- : parts extracted from the component side.
 - : parts extracted from the conductor side.
 - : part mounted on the conductor side.



5. MOUNTING DIAGRAM

● Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
IC011	J-4	Q325	H-13	D321	G-10	D745	H-8
IC101	D-17	Q326	H-12	D401	D-2	D751	G-7
IC201	H-11	Q501	B-3	D402	C-2	D752	G-7
IC202	G-10	Q601	C-22	D411	I-3	D753	G-7
IC203	I-11	Q651	D-21	D412	H-3	D754	G-7
IC301	I-13	Q671	D-22	D413	G-3	D755	G-8
IC401	G-4	Q701	I-6	D414	G-2	D761	G-6
IC402	F-4	Q702	E-6	D415	F-3	D762	G-7
IC403	E-4	Q910	I-24	D416	E-2	D763	G-7
IC601	B-22	Q911	I-23	D417	E-3	D764	G-7
IC671	C-23	Q915	H-22	D671	C-23	D765	G-8
IC711	I-8	Q916	H-22	D701	F-7	D771	F-7
IC721	H-8	Q920	H-21	D702	F-7	D772	F-7
IC731	H-8	Q1101	H-19	D703	F-7	D773	F-7
IC741	G-8	Q1102	I-18	D704	F-7	D774	F-7
IC751	G-8	Q1125	G-16	D705	E-8	D775	F-8
IC761	F-8	Q1151	H-20	D706	E-8	D781	C-6
IC771	F-8	Q1152	G-19	D711	I-7	D782	D-6
IC1201	G-18	Q1175	E-16	D712	I-7	D783	D-6
IC1202	F-18	Q1231	I-16	D713	I-7	D784	E-6
IC1203	F-18	Q1232	I-17	D714	I-7	D791	E-6
IC1204	G-15	Q1233	H-16	D715	I-8	D901	J-22
Q201	H-11	Q1235	I-16	D722	I-7	D904	I-21
Q251	I-12	Q1236	I-15	D723	I-7	D910	J-23
Q301	E-13	Q1237	H-15	D724	I-7	D915	I-22
Q302	J-12	Q1238	I-16	D725	I-8	D920	H-21
Q305	F-12	Q1239	I-16	D731	H-7	D1101	I-18
Q310	D-13			D732	H-7	D1102	I-17
Q311	D-13	D011	J-5	D733	H-7	D1125	F-18
Q312	G-10	D301	E-12	D734	H-7	D1151	G-19
Q320	H-13	D302	D-13	D735	H-8	D1152	G-19
Q321	H-13	D303	J-13	D741	H-7	D1175	F-18
Q322	H-13	D304	F-10	D742	H-7	D1231	I-15
Q323	G-12	D311	F-13	D743	H-7	D1232	I-15
Q324	H-12	D312	H-10	D744	H-7	D1301	J-15

Note:
EA3: Saudi Arabia model
AED: DENMARK model

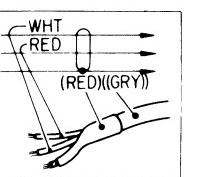
Note: SCHEMATIC DIAGRAM

- All capacitors are in μF unless otherwise noted. pF : $\mu\mu\text{F}$ 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
- : signal path.
- Components for right channel have same values as for left channel. Reference numbers are coded from 150, 250, 450, 650, 1150.
- : nonflammable resistor.
- : fusible resistor.
- : B+ bus.
- - - : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 $\text{k}\Omega/\text{V}$).
no mark: Not connecting speaker.
< > : When inserting headphone plug into HEAD-PHONES JACK.
- () : When AMFB switch is off connecting APM-177M speaker or a load resistor (1k – 1.5k) with speaker terminal.
(()) : When AMFB switch is ON connecting APM-177M speaker or a load resistor (1k – 1.5k) with speaker terminal.
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken to ground in no-signal mode by using oscilloscope.
Voltage variations may be noted due to normal production tolerances.
- Switches

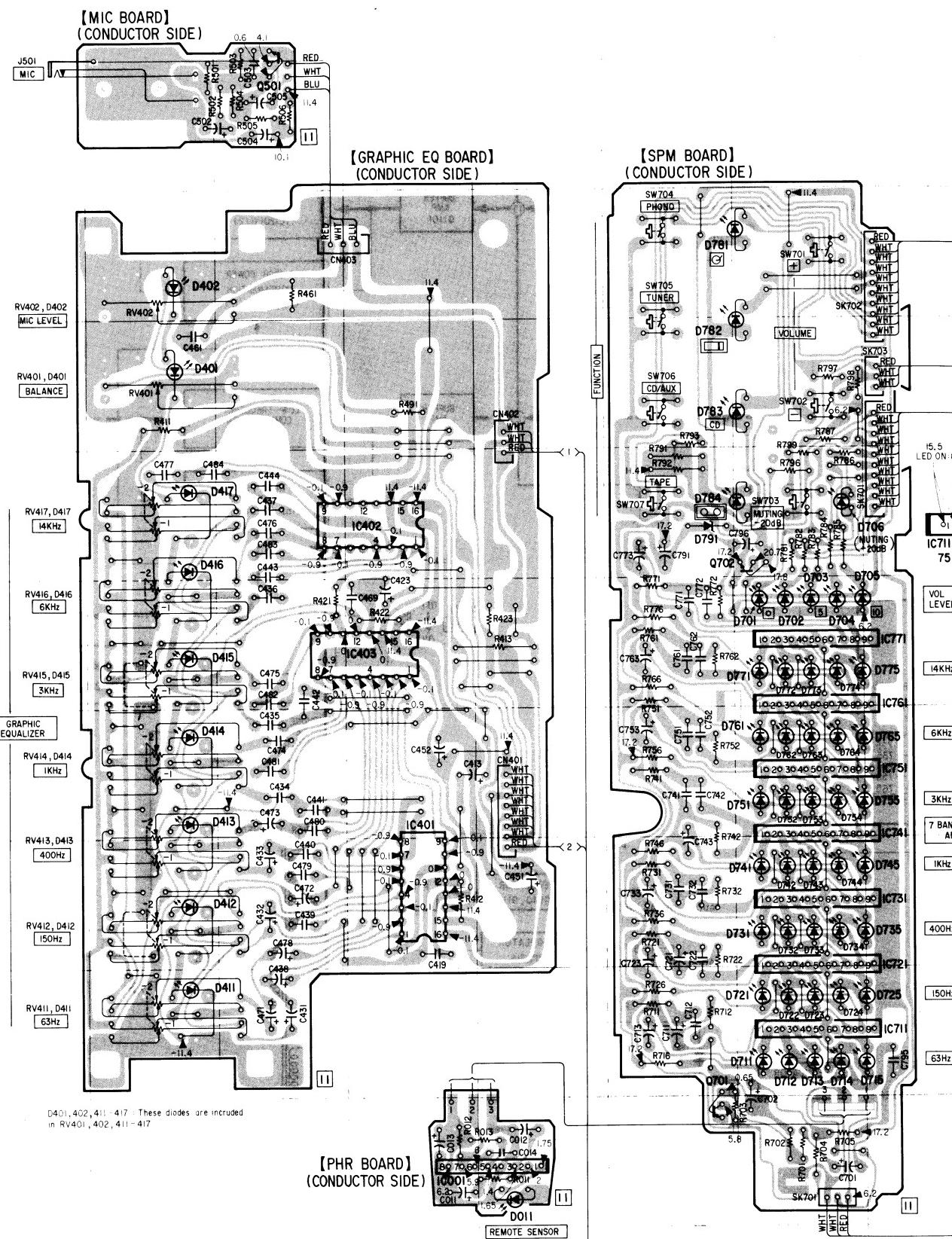
Ref. No.	Switch	Position
SW701	VOLUME UP	OFF
SW702	VOLUME DOWN	OFF
SW703	MUTING -20 dB	OFF
SW704	PHONO	OFF
SW705	TUNER	OFF
SW706	CD/AUX	OFF
SW707	TAPE	OFF
SW1001	POWER	OFF
SW1002	VOLTAGE SELECTOR (E, EA3 model only)	240 V
SW1201	AMFB	OFF

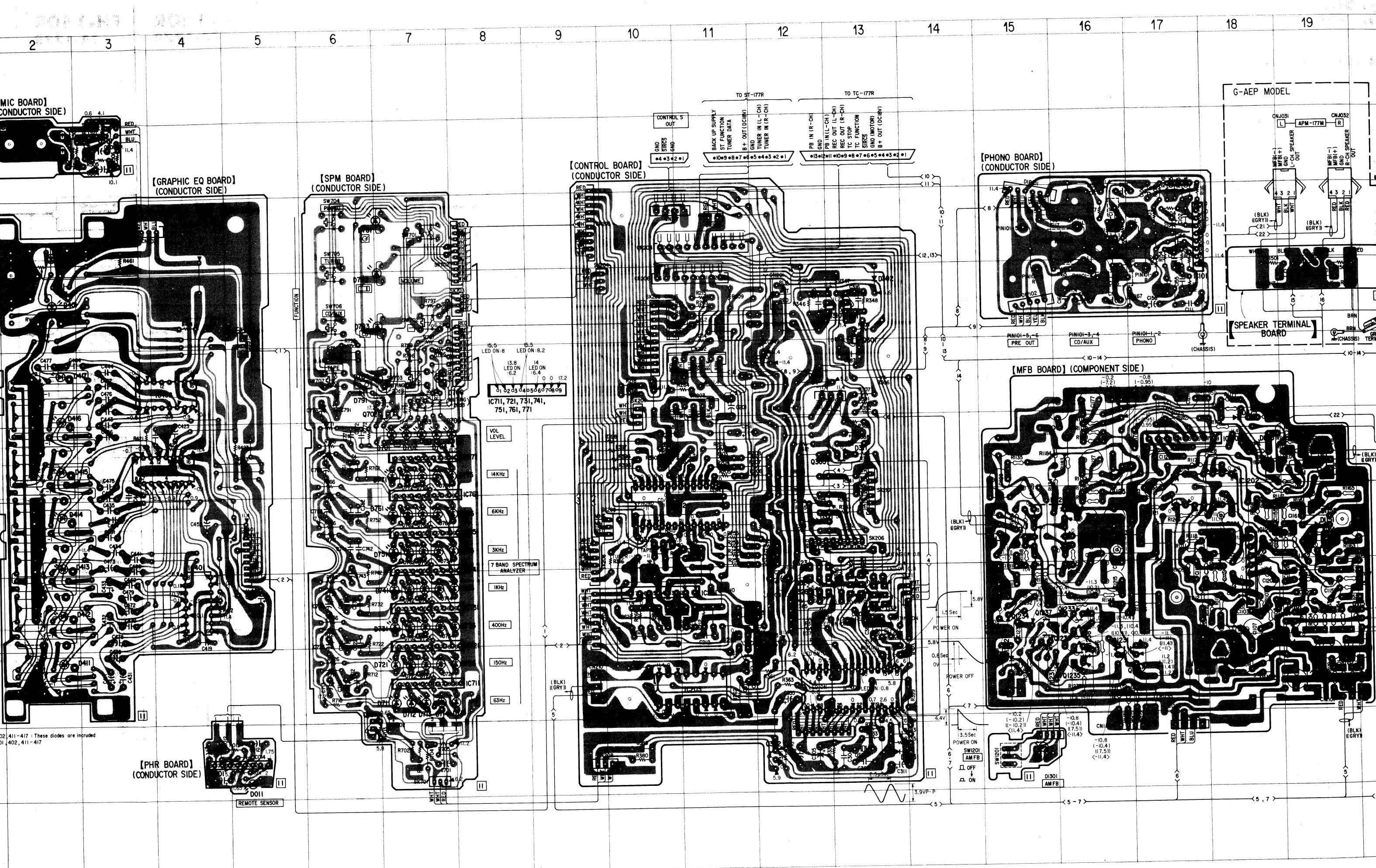
Note: MOUNTING DIAGRAM

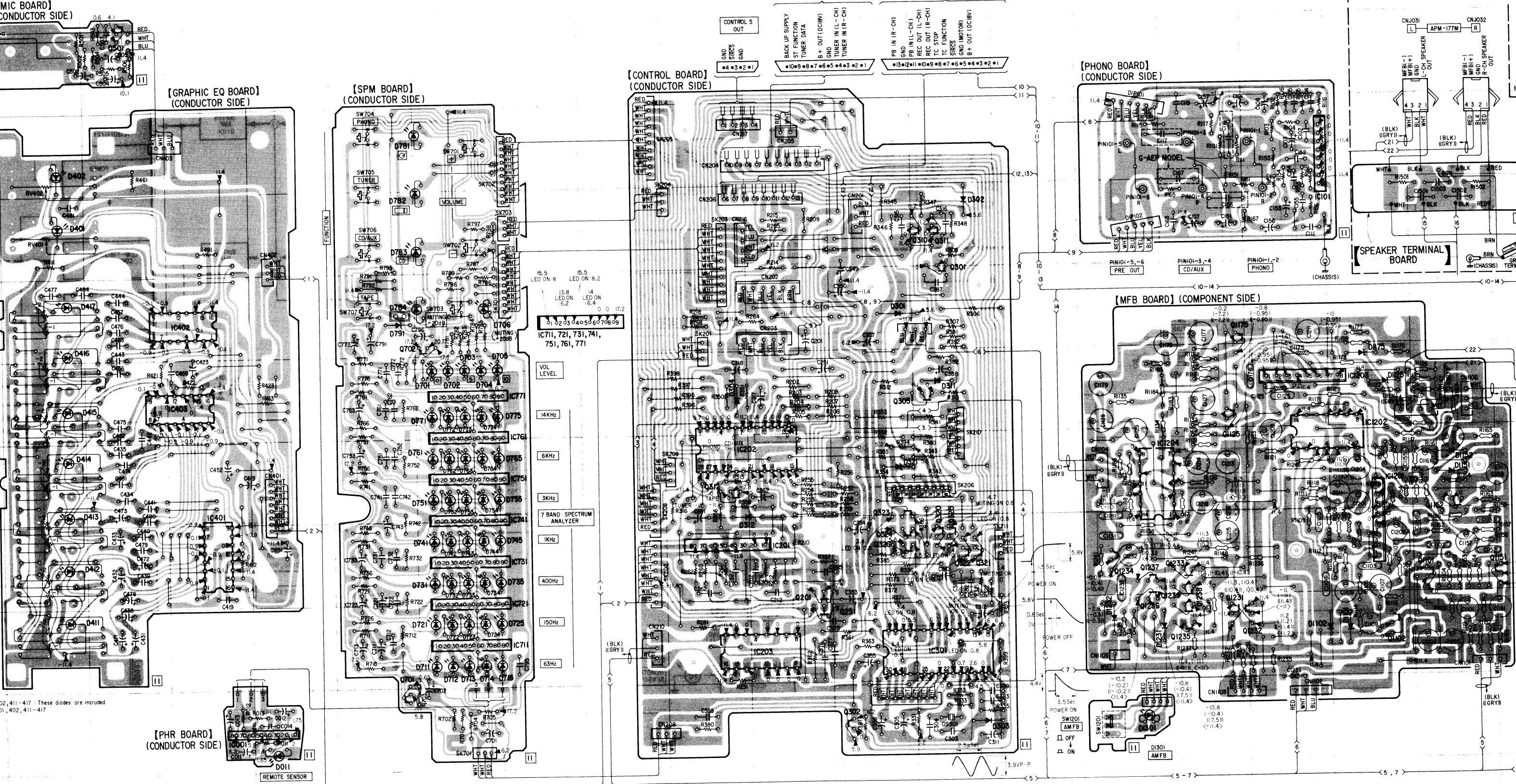
- Color code of sleeving over the end of the jacket.

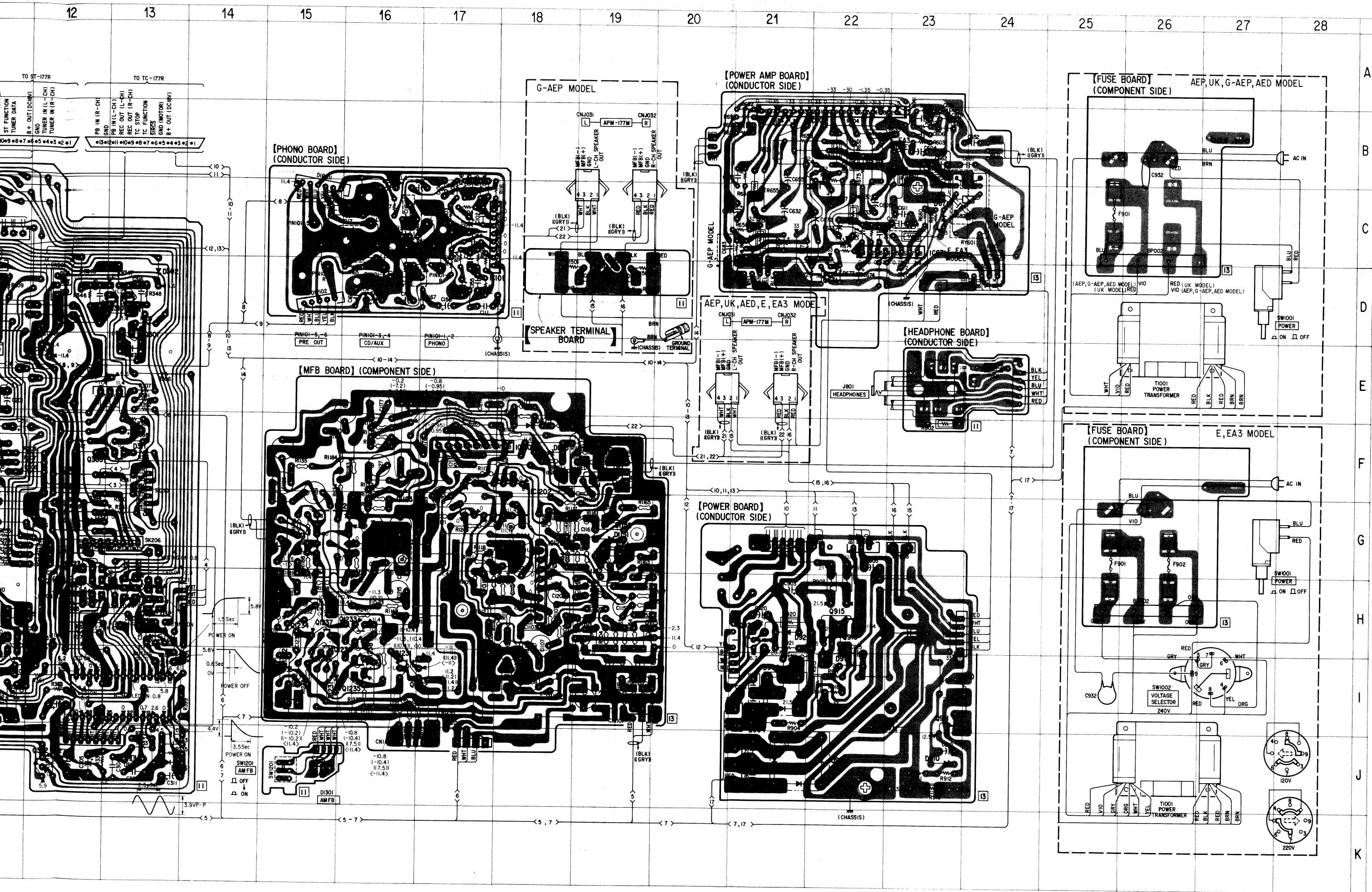


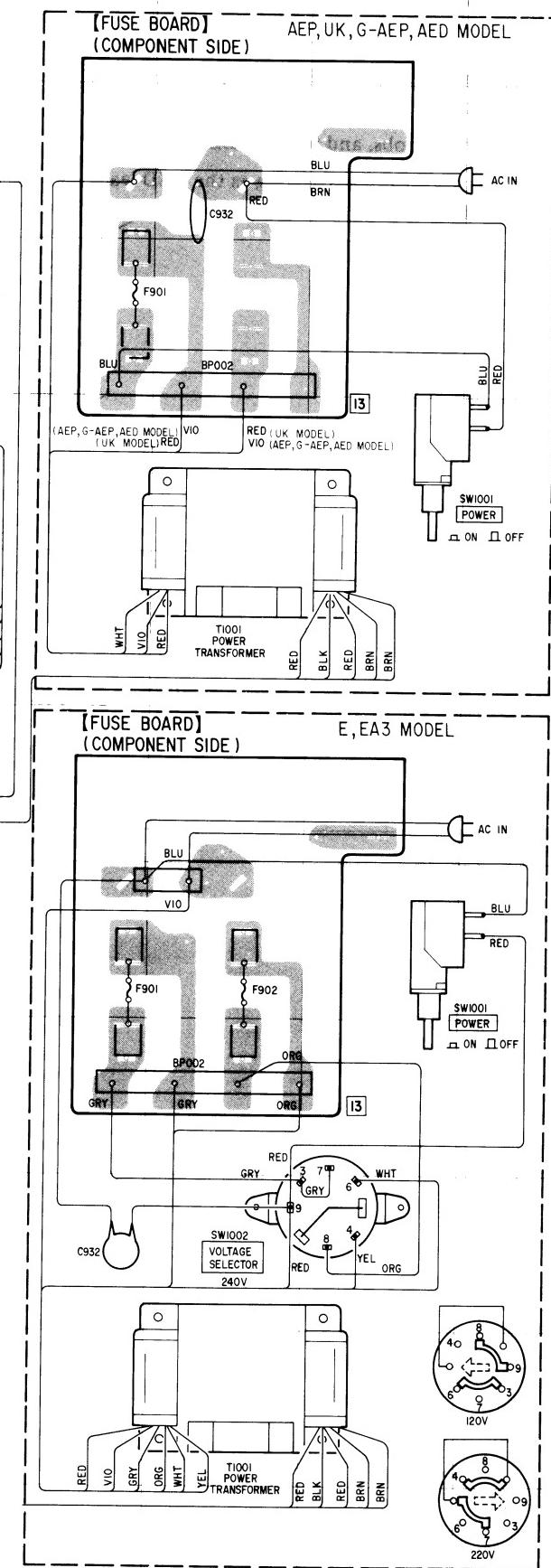
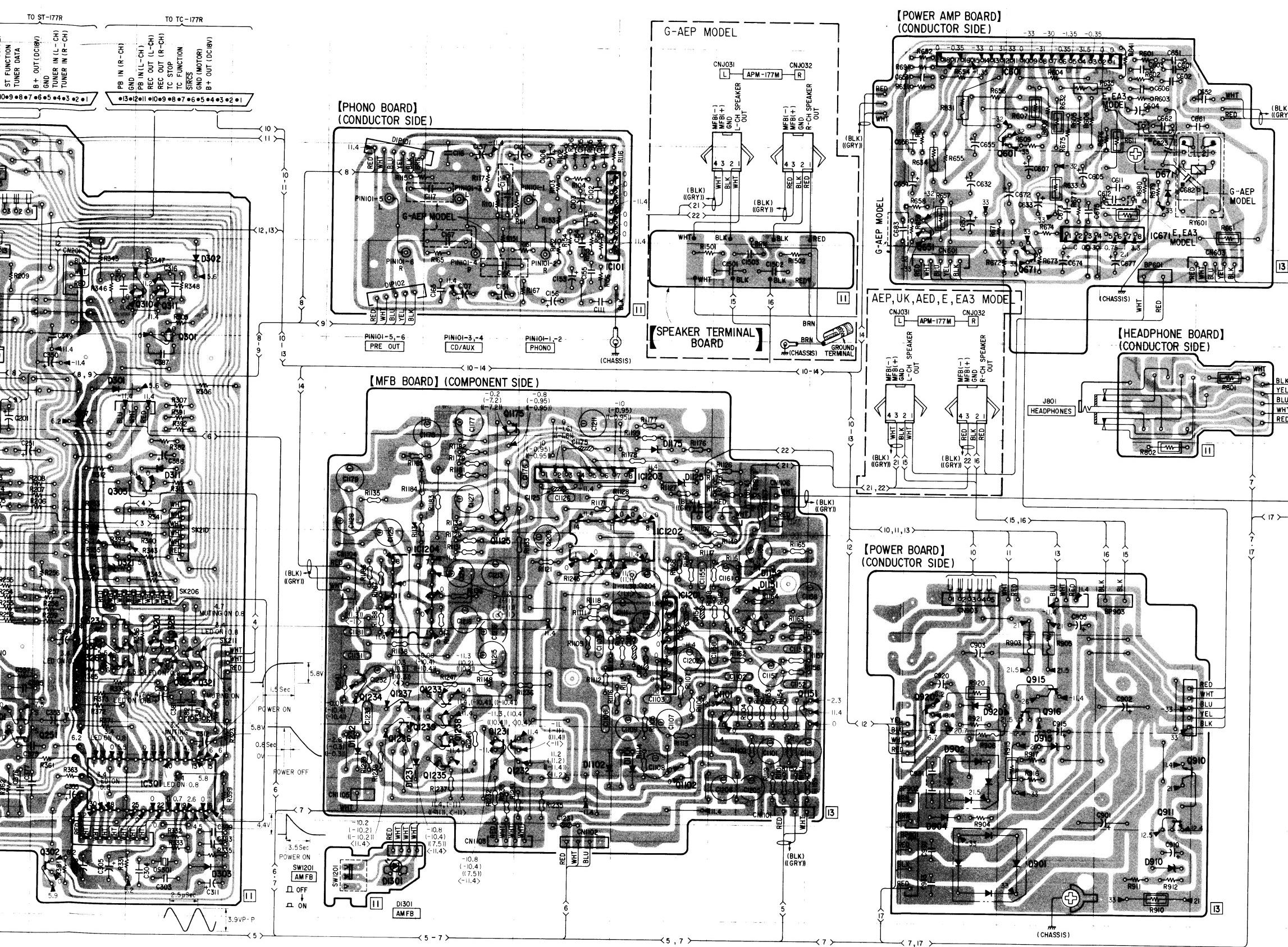
- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : part mounted on the conductor side.









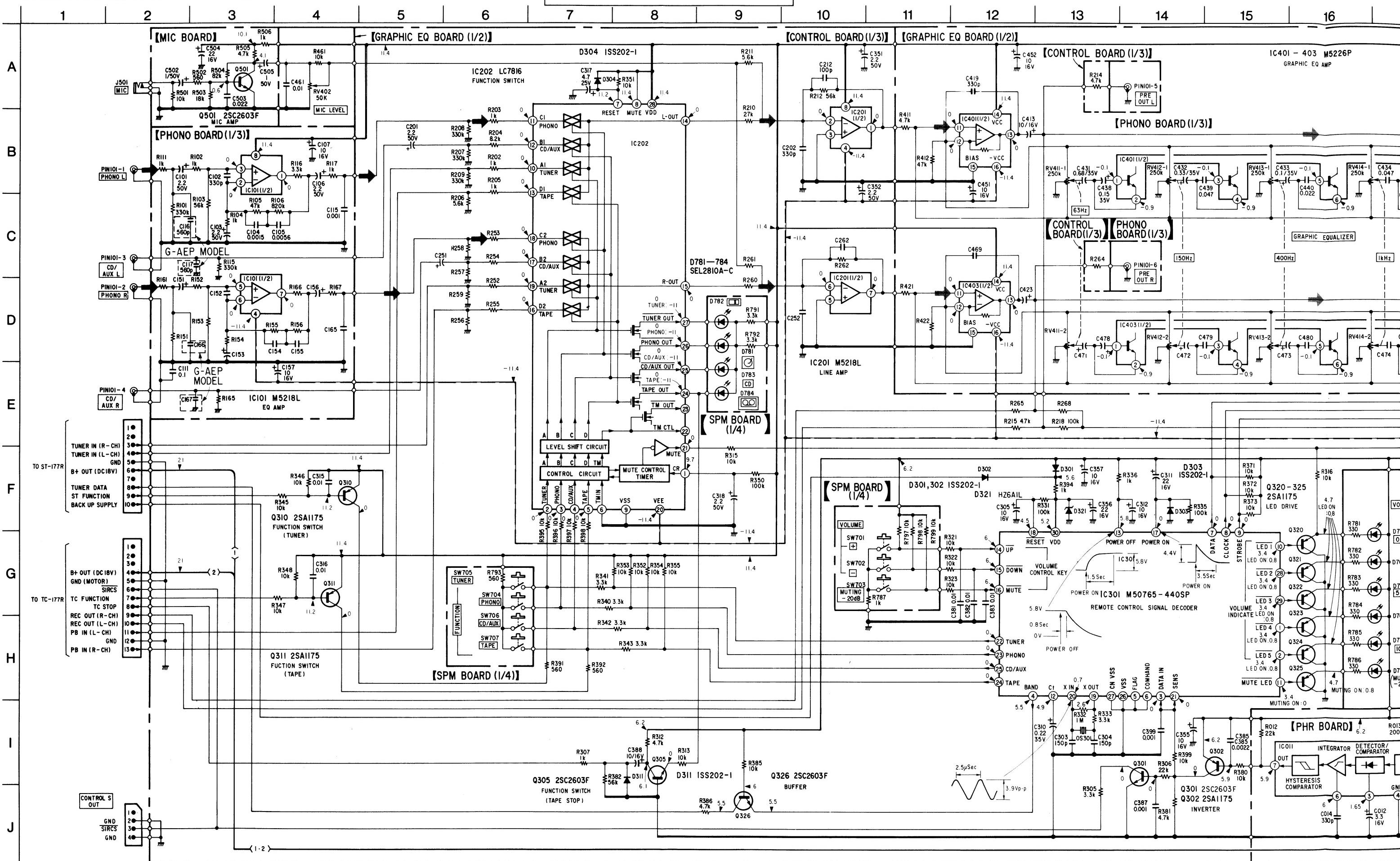


6. SCHEMATIC DIAGRAM

- See page TA-13 for notes.

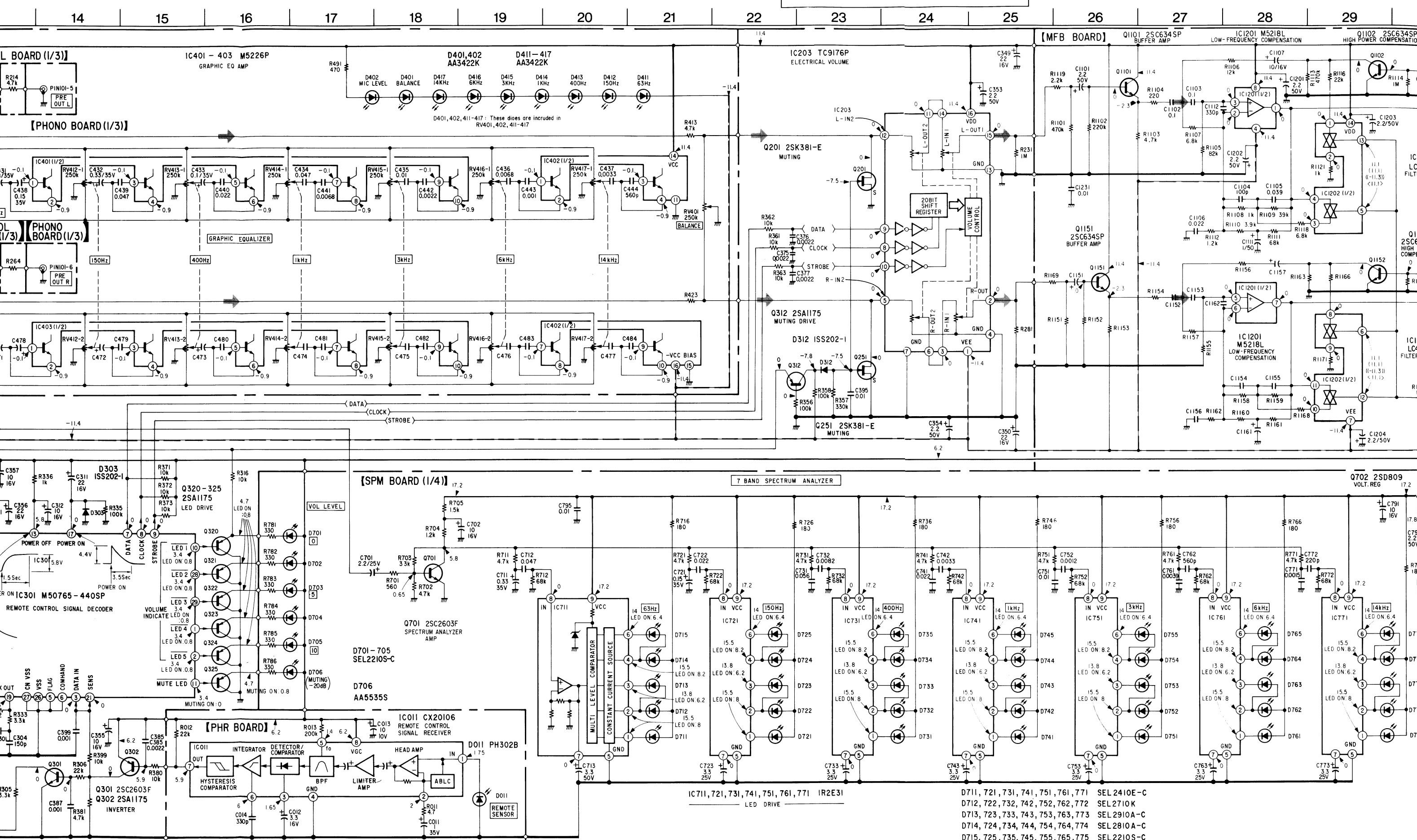
**FH-150R
TA-177R**

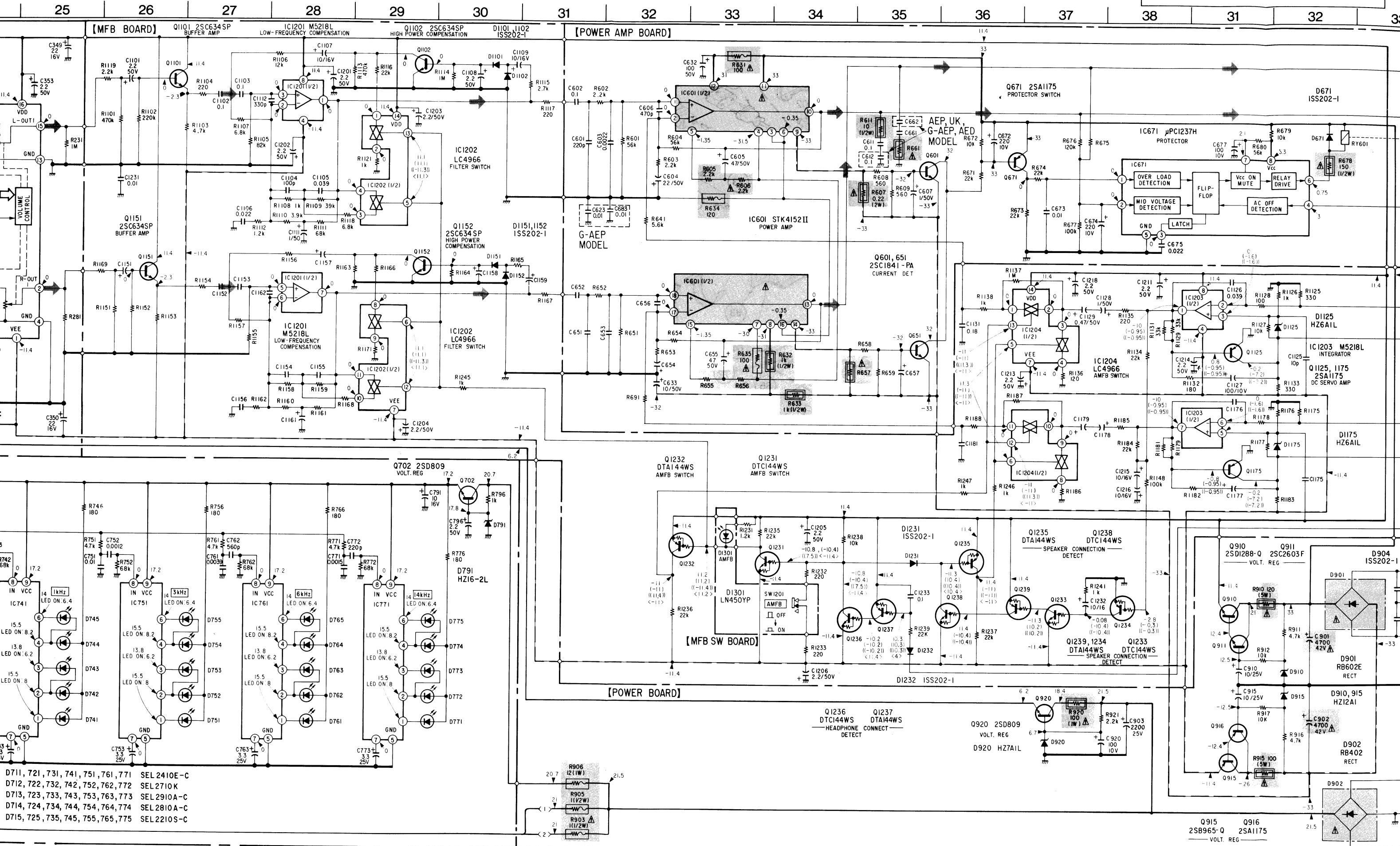
**FH-150R
TA-177R**

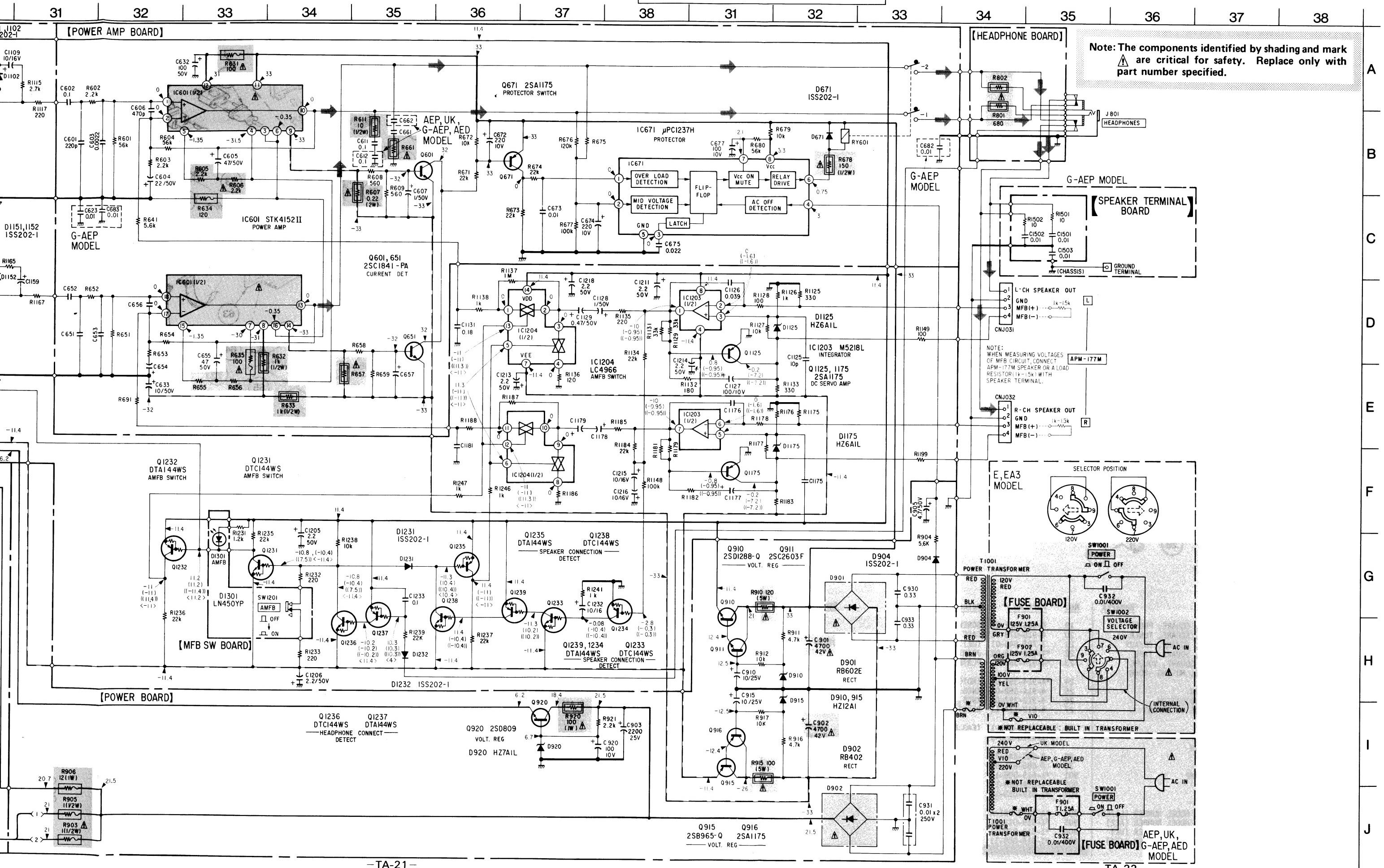


**FH-150R
TA-177R**

**FH-150R
TA-177R**





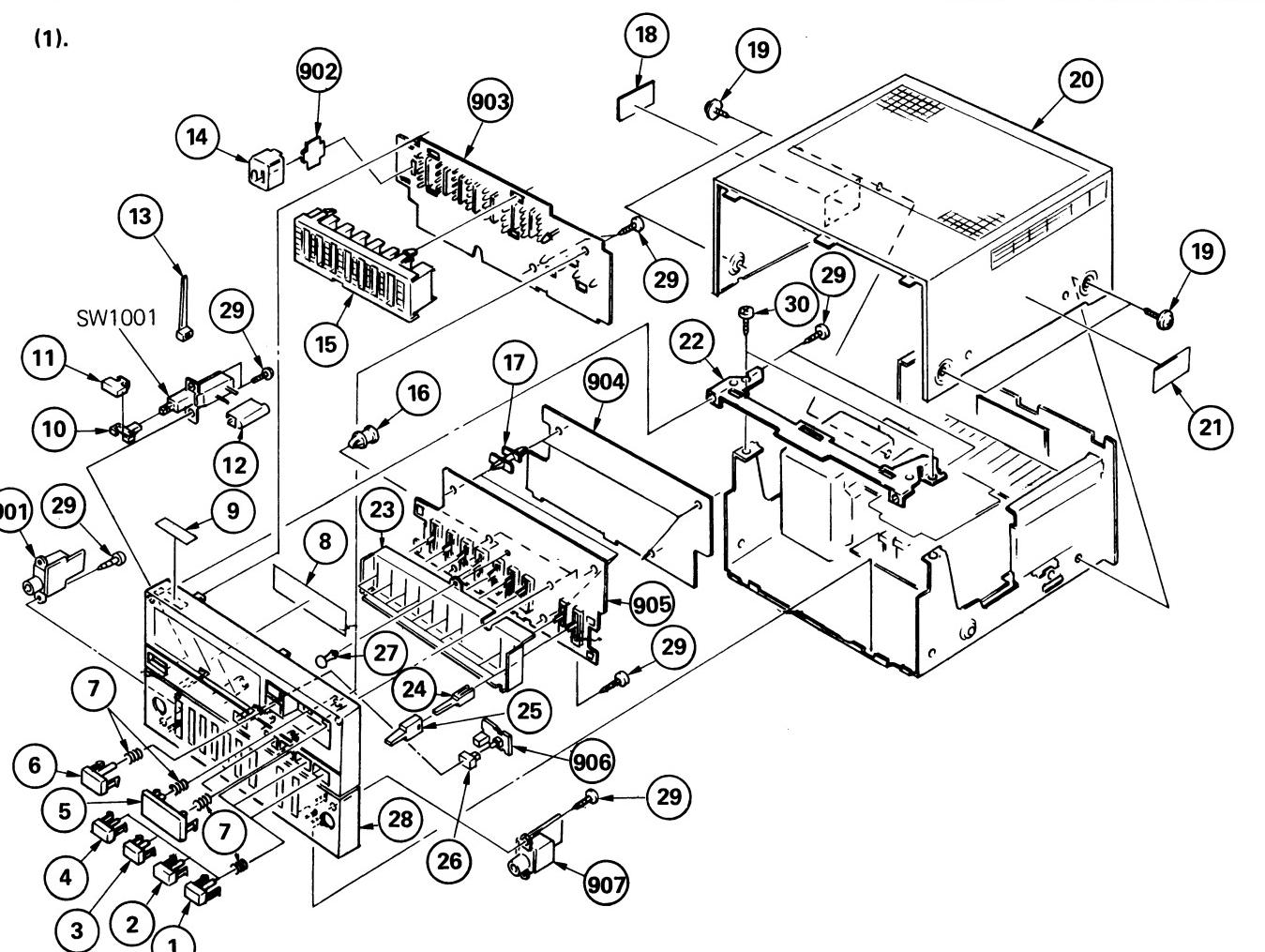


7. EXPLODED VIEWS AND PARTS LIST

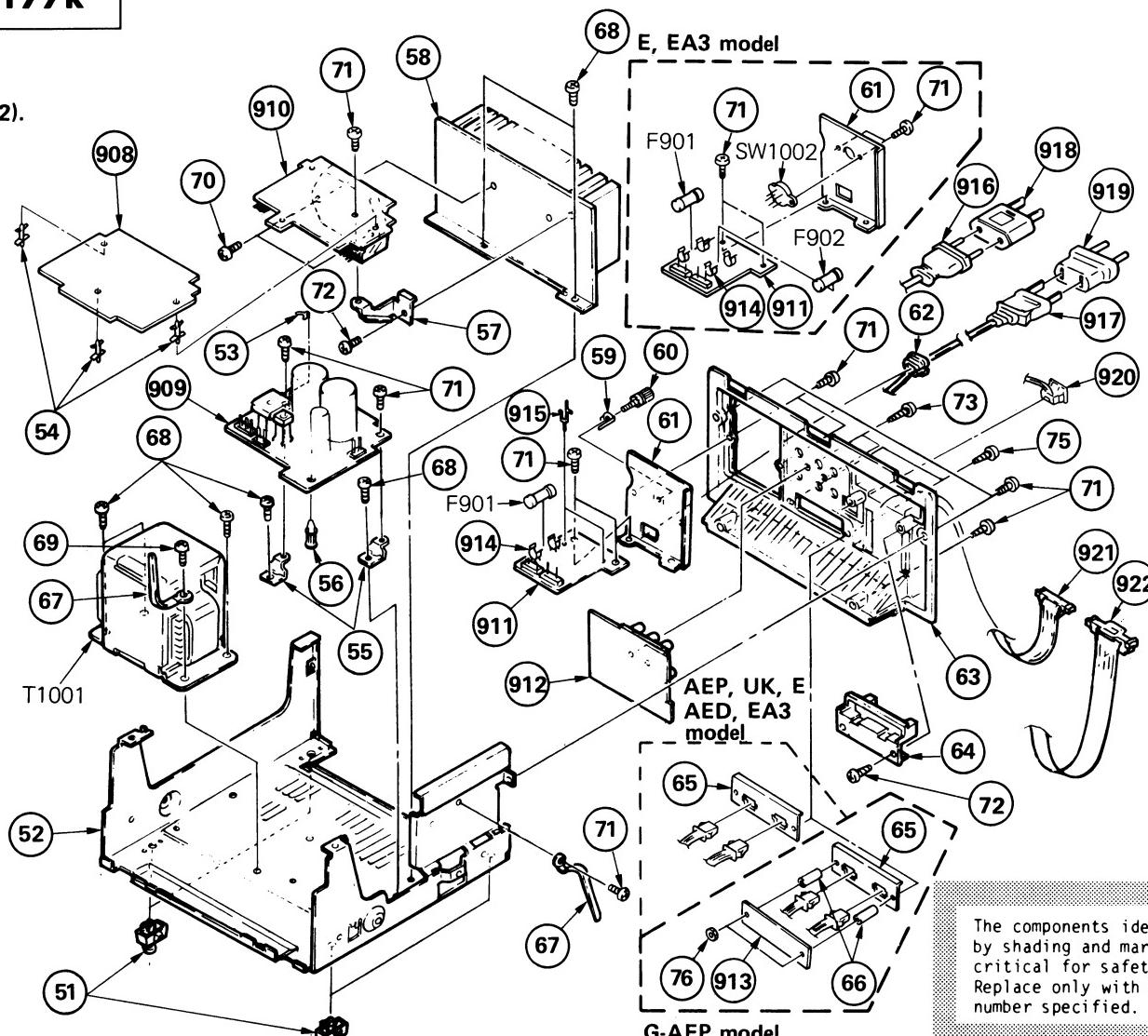
NOTE:
The mechanical parts with no reference number in the exploded views are not supplied.

The construction parts of an assembled part are indicated with a callout number in the remark column.

The components identified by shading and mark **⚠** are critical for safety. Replace only with part number specified.



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	4-914-350-31	BUTTON (FUNCTION), SQUARE, PHONO		19	4-886-821-01	SCREW, M3 CASE	
2	4-914-350-21	BUTTON (FUNCTION), SQUARE, TUNER		20	4-910-078-31	CASE	
3	4-914-350-11	BUTTON (FUNCTION), SQUARE, CD/AUX		21	3-703-845-01	(UK)...LABEL (N)(UIC), MAIN CAUTION	
4	4-914-350-01	BUTTON (FUNCTION), SQUARE, TAPE		22	*4-910-068-01	JOINT	
5	4-910-094-11	BUTTON (UP-DOWN), SQUARE, VOLUME		23	*4-914-353-01	PLATE, BLIND	
6	4-910-087-61	BUTTON (B), SQUARE, MUTING -20dB		24	*4-914-351-01	INDICATOR	
7	4-886-032-00	SPRING, COMPRESSION		25	4-914-352-01	KNOB, SLIDE	
8	*4-910-099-11	PLATE (8 GANG), INDICATION		26	4-910-392-01	KNOB, SQUARE, AMFB	
9	3-701-690-00	(UK)...LABEL (MADE IN JAPAN)		27	4-812-134-11	RIVET NYLON, 3.5	
10	4-910-058-01	JOINT, KNOB		28	X-4910-050-1	(EA3,E)...PANEL ASSY, FRONT	
11	4-910-056-11	KNOB, POWER			X-4910-050-2	(G-AEP,AEP,UK,AED)...PANEL ASSY, FRONT	
12	3-575-524-00	COVER, POWER SWITCH		29	7-685-646-71	SCREW +BVTP 3X8 TYPE2 N-S	
13	3-701-748-00	CLAMP		30	7-685-871-01	SCREW +BVTT 3X6 (S)	
14	*4-910-301-01	PLATE, SHIELD		901	*1-619-008-11	PC BOARD, HP	
15	*4-910-306-01	HOUSE (8 GANG), LAMP		902	*1-619-014-11	PC BOARD, PHR	
16	*3-669-610-00	SPACER		903	*1-619-013-11	PC BOARD, SPM	
17	3-659-619-01	HOLDER, PC BOARD		904	*A-4375-251-A	MOUNTED PCB, CONTROL	
18	*4-914-325-01	(E,EA3)...LABEL, MODEL NUMBER (E2/E3)		905	*1-619-011-11	PC BOARD, GRAPHIC EQ	
	*4-914-326-11	(AEP,AED)...LABEL, MODEL NUMBER (AE2)		906	*1-619-039-11	PC BOARD, MFB SW	
	*4-914-327-01	(UK)...LABEL, MODEL NUMBER (UK)		907	*1-619-009-11	PC BOARD, MIC	
	*4-914-328-01	(G-AEP)...LABEL, MODEL NUMBER (AE4)			ASW1001.1-553-318-51	SWITCH, PUSH (AC POWER)(1 KEY), POWER	



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	X-4902-937-1	FOOT ASSY, RUBBER		76	7-684-023-04	(G-AEP)...N 3, TYPE2	
52	*4-902-974-01	CHASSIS		908	*A-4388-532-A	_MOUNTED PCB, MFB	
53	*4-904-446-01	PLATE, GROUND		909	*A-4394-377-A	(G-AEP,AEP,UK,AED)..._MOUNTED PCB, POWER	
54	3-659-619-01	HOLDER, PC BOARD			*A-4394-379-A	(EA3,E)..._MOUNTED PCB, POWER	
55	*4-910-393-01	BRACKET, PC BOARD		56	*3-669-610-00	SPACER	
				57	*4-910-064-01	BRACKET (H), PC BOARD	
				58	*4-910-077-01	HEAT SINK	
				59	3-701-993-00	(G-AEP)...SPACER, TERMINAL	
				60	3-706-165-00	(G-AEP)...SCREW	
				61	*4-910-073-01	(G-AEP,AEP,UK,AED)...BRACKET, INLET	
					*4-910-073-11	(EA3,E)..._BRACKET, INLET	
				62	3-703-244-00	(G-AEP,AEP,UK,AED,EA3)...BUSHING(2104), CORD	
					3-703-571-00	(E)..._BUSHING(4516), CORD	
				63	*4-910-079-11	PLATE, JACK	
				64	*4-910-302-01	HOLDER (H), WIRE	
				65	*4-910-390-01	BRACKET, MFB	
				66	3-654-603-00	(G-AEP)...SPACER	
				67	*3-703-150-11	CLAMP	
				68	7-682-546-04	SCREW +BVTT 3X5 (S)	
				69	7-685-751-09	SCREW +BVTT 3X6 (S)	
				70	7-685-650-71	SCREW +BVTP 3X16 TYPE2 IT-3	
				71	7-685-871-01	SCREW +BVTT 3X6 (S)	
				72	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
				73	7-685-647-14	SCREW +BVTP 3X10 TYPE2 N-S	
				75	7-685-877-01	(G-AEP)...SCREW +BVTT 3X20	
					7-685-871-01	(AEP,UK,AED,EA3,E)...SCREW +BVTT 3X6 (S)	
				68	E, EA3 model		
				69	F901	AEP, UK, E, AED, EA3 model	
				70	SW1002		
				71	F902		
				72	916	E, EA3 model	
				73	917	AEP, UK, E, AED, EA3 model	
				74	918	AEP, UK, E, AED, EA3 model	
				75	919	AEP, UK, E, AED, EA3 model	
				76	920	G-AEP model	
				77	921	The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.	
				78	922	The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.	

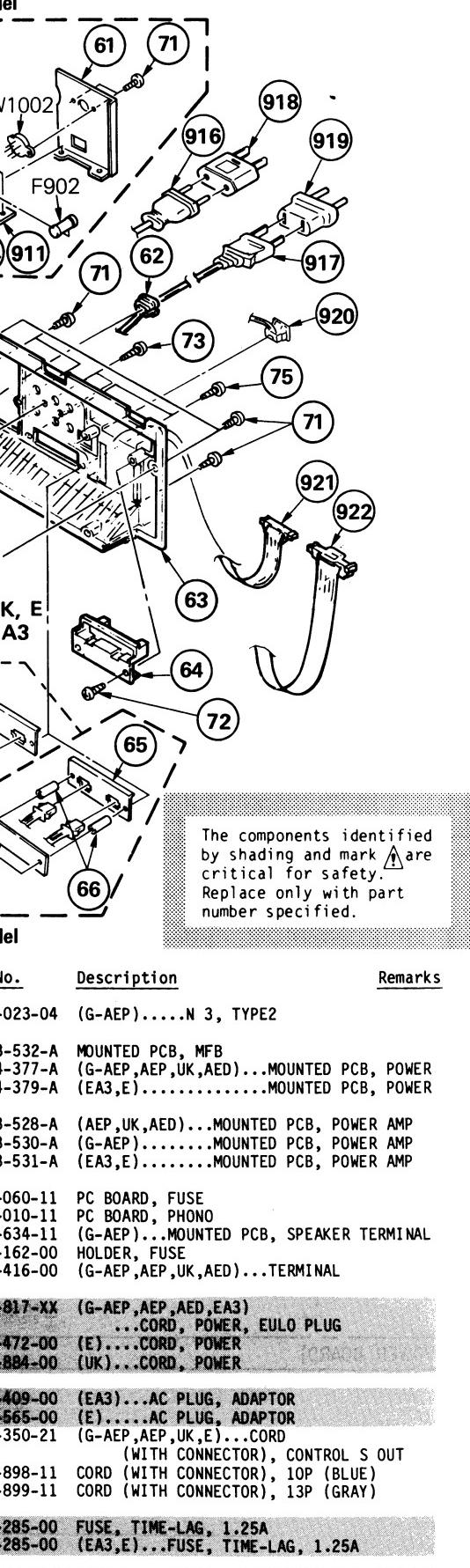
8. ELECTRIC

NOTE:

Items marked **⚠** are selected for service. Some are stocked when ordered.

If there are set such as a typical circuit, capacitors and circuits may be

Ref.No.	Part No.
901	*1-619-008-11
902	*1-619-011-11
903	*1-619-014-11
904	*A-4375-251-A
905	*1-619-023-04
906	*1-619-039-11
907	*1-619-044-11
908	*A-4388-532-A
909	*A-4394-377-A
910	*A-4394-379-A
911	*1-619-053-00
912	*1-619-056-00
913	*1-619-058-01
914	1-533-162-00
915	1-535-416-00
916	AEP, UK, E, AED, EA3 model
917	AEP, UK, E, AED, EA3 model
918	AEP, UK, E, AED, EA3 model
919	AEP, UK, E, AED, EA3 model
920	G-AEP model
921	The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.
922	The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.
BP002	*1-535-416-00
BP001	*1-535-416-00
BP002	*1-535-416-00
BP003	*1-535-416-00
C011	1-131-162-00
C012	1-131-162-00
C013	1-131-162-00
C014	1-102-162-00
C101	1-123-162-00
C102	1-162-162-00
C103	1-123-162-00
C104	1-110-162-00
C105	1-110-162-00
C106	1-123-162-00
C107	1-123-162-00
C111	1-136-162-00
C115	1-162-162-00
C116	1-162-162-00
C117	1-162-162-00



8. ELECTRICAL PARTS LIST

NOTE:

- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS:
• All resistors are in ohms.

• F : nonflammable

COILS:
• MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

Note:
EA3: Saudi Arabia model
AED: DENMARK model

The components identified by shading and mark ▲ are critical for safety.
Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
901	*1-619-008-11	PC BOARD, HP
902	*1-619-014-11	PC BOARD, PHR
903	*1-619-013-11	PC BOARD, SPM
904	*A-4375-251-A	MOUNTED PCB, CONTROL
905	*1-619-011-11	PC BOARD, GRAPHIC EQ
906	*1-619-039-11	PC BOARD, MFB SW
907	*1-619-009-11	PC BOARD, MIC
908	*A-4388-532-A	MOUNTED PCB, MFB
909	*A-4394-377-A	(G-AEP,AEP,UK,AED) ...MOUNTED PCB, POWER
	*A-4394-379-A	(EA3,E).....MOUNTED PCB, POWER
910	*A-4388-528-A	(AEP,UK,AED)...MOUNTED PCB, POWER AMP
	*A-4388-530-A	(G-AEP).....MOUNTED PCB, POWER AMP
	*A-4388-531-A	(EA3,E).....MOUNTED PCB, POWER AMP
911	*1-618-060-11	PC BOARD, FUSE
912	*1-619-010-11	PC BOARD, PHONO
913	*1-619-634-11	(G-AEP)...MOUNTED PCB, SPEAKER TERMINAL
914	1-533-162-00	HOLDER, FUSE
915	1-535-416-00	(G-AEP,AEP,UK,AED)...TERMINAL
916	▲.1-534-817-XX	(G-AEP,AEP,AED,EA3) ...CORD, POWER, EUO PLUG
917	▲.1-551-472-00	(E)...CORD, POWER
	▲.1-551-884-00	(UK)...CORD, POWER
918	▲.1-506-409-00	(EA3)...AC PLUG, ADAPTOR
919	▲.1-526-565-00	(E)...AC PLUG, ADAPTOR
920	1-558-350-21	(G-AEP,AEP,UK,E) ...CORD (WITH CONNECTOR), CONTROL S OUT
921	1-557-898-11	CORD (WITH CONNECTOR), 10P (BLUE)
922	1-557-899-11	CORD (WITH CONNECTOR), 13P (GRAY)
BP002	*1-535-141-00	BASE POST 22MM (10MM PITCH) 4P
BP901	*1-535-116-00	TERMINAL
BP902	*1-535-115-00	TERMINAL
BP903	*1-535-115-00	TERMINAL
C011	1-131-347-00	TANTALUM 1MF 10% 35V
C012	1-131-368-00	TANTALUM 3.3MF 10% 16V
C013	1-131-377-00	TANTALUM 10MF 20% 10V
C014	1-102-112-00	CERAMIC 330PF 10% 50V
C101	1-123-612-00	ELECT 2.2MF 20% 50V
C102	1-162-288-31	CERAMIC 330PF 10% 50V
C356	1-123-622-00	ELECT 22MF 20% 16V
C357	1-123-617-00	ELECT 10MF 20% 16V
C375	1-162-302-31	CERAMIC 0.0022MF 30% 16V
C103	1-123-612-00	ELECT 2.2MF 20% 50V
C104	1-110-197-00	MYLAR 0.0015MF 5% 50V
C105	1-110-204-00	MYLAR 0.0056MF 5% 50V
C106	1-123-612-00	ELECT 2.2MF 20% 50V
C107	1-123-617-00	ELECT 10MF 20% 16V
C111	1-136-165-00	FILM 0.1MF 5% 50V
C115	1-162-294-31	CERAMIC 0.001MF 10% 50V
C116	1-162-291-31	(G-AEP)...CERAMIC 560PF 10% 50V
C117	1-162-291-31	(G-AEP)...CERAMIC 560PF 10% 50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description
C151	1-123-612-00	ELECT 2.2MF 20% 50V
C152	1-162-288-31	CERAMIC 330PF 10% 50V
C153	1-123-612-00	ELECT 2.2MF 20% 50V
C154	1-110-197-00	MYLAR 0.0015MF 5% 50V
C155	1-110-204-00	MYLAR 0.0056MF 5% 50V
C156	1-123-612-00	ELECT 2.2MF 20% 50V
C157	1-123-617-00	ELECT 10MF 20% 16V
C165	1-162-294-31	CERAMIC 0.001MF 10% 50V
C166	1-162-291-31	(G-AEP)...CERAMIC 560PF 10% 50V
C167	1-162-291-31	(G-AEP)...CERAMIC 560PF 10% 50V
C201	1-123-612-00	ELECT 2.2MF 20% 50V
C202	1-162-288-31	CERAMIC 330PF 10% 50V
C212	1-162-282-31	CERAMIC 100PF 10% 50V
C251	1-123-612-00	ELECT 2.2MF 20% 50V
C252	1-162-288-31	CERAMIC 330PF 10% 50V
C262	1-162-282-31	CERAMIC 100PF 10% 50V
C303	1-162-284-31	CERAMIC 150PF 10% 50V
C304	1-162-284-31	CERAMIC 150PF 10% 50V
C305	1-123-617-00	ELECT 10MF 20% 16V
C310	1-131-343-00	TANTALUM 0.22MF 10% 35V
C311	1-123-622-00	ELECT 22MF 20% 16V
C312	1-123-617-00	ELECT 10MF 20% 16V
C315	1-162-306-31	CERAMIC 0.01MF 30% 16V
C316	1-162-306-31	CERAMIC 0.01MF 30% 16V
C317	1-123-616-00	ELECT 4.7MF 20% 25V
C318	1-123-612-00	ELECT 2.2MF 20% 50V
C349	1-123-622-00	ELECT 22MF 20% 16V
C350	1-123-622-00	ELECT 22MF 20% 16V
C351	1-123-612-00	ELECT 2.2MF 20% 50V
C352	1-123-612-00	ELECT 2.2MF 20% 50V
C353	1-123-612-00	ELECT 2.2MF 20% 50V
C354	1-123-612-00	ELECT 2.2MF 20% 50V
C355	1-123-617-00	ELECT 10MF 20% 16V
C356	1-123-622-00	ELECT 22MF 20% 16V
C357	1-123-617-00	ELECT 10MF 20% 16V
C375	1-162-302-31	CERAMIC 0.0022MF 30% 16V
C376	1-162-302-31	CERAMIC 0.0022MF 30% 16V
C377	1-162-302-31	CERAMIC 0.0022MF 30% 16V
C381	1-162-306-31	CERAMIC 0.01MF 30% 16V
C382	1-162-306-31	CERAMIC 0.01MF 30% 16V
C383	1-162-306-31	CERAMIC 0.01MF 30% 16V
C385	1-162-302-31	CERAMIC 0.0022MF 30% 16V
C387	1-162-294-31	CERAMIC 0.001MF 10% 50V
C388	1-123-617-00	ELECT 10MF 20% 16V
C395	1-162-306-31	CERAMIC 0.01MF 30% 16V
C396	1-162-294-31	CERAMIC 0.001MF 10% 50V
C397	1-162-294-31	CERAMIC 0.001MF 10% 50V
C398	1-123-617-00	ELECT 10MF 20% 16V
C399	1-162-294-31	CERAMIC 0.001MF 10% 50V
C400	1-162-294-31	CERAMIC 0.001MF 10% 50V
C401	1-162-294-31	CERAMIC 0.001MF 10% 50V
C402	1-162-294-31	CERAMIC 0.001MF 10% 50V
C403	1-162-294-31	CERAMIC 0.001MF 10% 50V
C404	1-162-294-31	CERAMIC 0.001MF 10% 50V
C405	1-162-294-31	CERAMIC 0.001MF 10% 50V
C406	1-162-294-31	CERAMIC 0.001MF 10% 50V
C407	1-162-294-31	CERAMIC 0.001MF 10% 50V
C408	1-162-294-31	CERAMIC 0.001MF 10% 50V
C409	1-162-294-31	CERAMIC 0.001MF 10% 50V
C410	1-162-294-31	CERAMIC 0.001MF 10% 50V
C411	1-162-294-31	CERAMIC 0.001MF 10% 50V
C412	1-162-294-31	CERAMIC 0.001MF 10% 50V
C413	1-131-371-00	TANTALUM 10MF 10% 16V
C414	1-162-288-31	CERAMIC 330PF 10% 50V
C423	1-131-371-00	TANTALUM 10MF 10% 16V
C431	1-131-346-00	TANTALUM 0.68MF 10% 35V
C432	1-131-344-00	TANTALUM 0.33MF 10% 35V
C433	1-131-341-00	TANTALUM 0.1MF 10% 35V
C434	1-136-161-00	FILM 0.047MF 5% 50V
C435	1-162-306-31	CERAMIC 0.01MF 20% 16V
C436	1-162-305-31	CERAMIC 0.0068MF 20% 16V
C437	1-162-303-31	CERAMIC 0.0033MF 20% 16V
C438	1-131-342-00	TANTALUM 0.15MF 10% 35V
C439	1-136-161-00	FILM 0.047MF 5% 50V
C440	1-162-596-00	CERAMIC 0.022MF 20% 25V
C441	1-162-305-31	CERAMIC 0.0068MF 20% 16V
C442	1-162-302-31	CERAMIC 0.0022MF 20% 16V
C443	1-162-294-31	CERAMIC 0.001MF 10% 50V
C444	1-162-291-31	CERAMIC 560PF 10% 50V
C445	1-131-371-00	TANTALUM 10MF 10% 16V
C446	1-131-371-00	TANTALUM 10MF 10% 16V
C447	1-162-306-31	CERAMIC 0.01MF 30% 16V
C448	1-131-344-00	TANTALUM 0.33MF 10% 35V
C449	1-162-288-31	CERAMIC 330PF 10% 50V
C450	1-131-346-00	TANTALUM 0.68MF 10% 35V
C451	1-131-371-00	

ELECTRICAL PARTS			ELECTRICAL PARTS			ELECTRICAL PARTS			ELECTRICAL PARTS		
Ref.No.	Part No.	Description	Ref.No.	Part No.	Description	Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
C399	1-162-294-31	CERAMIC 0.001MF 10% 50V	C656	1-162-290-31	CERAMIC 470PF 10% 50V	C1109	1-123-617-00	ELECT 10MF 20% 16V	CN601 *1-560-070-00	BASE POST 5P	
C413	1-131-371-00	TANTALUM 10MF 10% 16V	C657	1-123-380-00	ELECT 1MF 20% 50V	C1111	1-123-611-00	ELECT 1MF 20% 50V	CN603 *1-560-070-00	BASE POST 5P	
C419	1-162-288-31	CERAMIC 330PF 10% 50V	C661	1-136-165-00	FILM 0.1MF 5% 50V	C1112	1-162-288-31	CERAMIC 330PF 10% 50V	CN903 *1-560-063-00	PIN, CONNECTOR 5P	
C423	1-131-371-00	TANTALUM 10MF 10% 16V	C662	1-136-165-00	(G-AEP,AEP,UK,AED)... FILM 0.1MF 5% 50V	C1125	1-162-199-11	CERAMIC 10PF 10% 50V	CN1101 *1-564-506-11	PLUG, CONNECTOR 3P	
C431	1-131-346-00	TANTALUM 0.68MF 10% 35V	C672	1-123-308-00	ELECT 220MF 20% 10V	C1126	1-136-160-00	FILM 0.039MF 5% 50V	CN1102 *1-564-507-11	PLUG, CONNECTOR 4P	
C432	1-131-344-00	TANTALUM 0.33MF 10% 35V	C673	1-162-306-31	CERAMIC 0.01MF 30% 16V	C1127	1-123-307-00	ELECT 100MF 20% 10V	CN1103 *1-564-338-00	PIN, CONNECTOR 4P	
C433	1-131-341-00	TANTALUM 0.1MF 10% 35V	C674	1-123-308-00	ELECT 220MF 20% 10V	C1128	1-123-611-00	ELECT 1MF 20% 50V	CN1104 *1-564-506-11	PLUG, CONNECTOR 3P	
C434	1-136-161-00	FILM 0.047MF 5% 50V	C675	1-136-157-00	FILM 0.022MF 5% 50V	C1129	1-123-610-00	ELECT 0.47MF 20% 50V	CN1105 *1-564-505-11	PLUG, CONNECTOR 2P	
C435	1-162-306-31	CERAMIC 0.01MF 20% 16V	C677	1-123-307-00	ELECT 100MF 20% 10V	C1131	1-136-168-00	FILM 0.18MF 5% 50V	CN1106 *1-564-506-11	PLUG, CONNECTOR 3P	
C436	1-162-305-31	CERAMIC 0.0068MF 20% 16V	C682	1-161-330-00	(G-AEP)...CERAMIC 0.01MF 30% 25V	C1151	1-123-612-00	ELECT 2.2MF 20% 50V	CN1107 *1-564-507-11	PLUG, CONNECTOR 4P	
C437	1-162-303-31	CERAMIC 0.0033MF 20% 16V	C683	1-162-306-31	(G-AEP)...CERAMIC 0.01MF 30% 16V	C1152	1-136-165-00	FILM 0.1MF 5% 50V	D011	8-719-110-32	DIODE PH302B
C438	1-131-342-00	TANTALUM 0.15MF 10% 35V	C701	1-131-355-00	TANTALUM 2.2MF 10% 25V	C1153	1-136-165-00	FILM 0.1MF 5% 50V	D301	8-719-911-19	DIODE ISS119
C439	1-136-161-00	FILM 0.047MF 5% 50V	C702	1-131-371-00	TANTALUM 10MF 10% 16V	C1154	1-162-282-31	CERAMIC 100PF 10% 50V	D302	8-719-911-19	DIODE ISS119
C440	1-162-596-00	CERAMIC 0.022MF 25V	C711	1-131-344-00	TANTALUM 0.33MF 10% 35V	C1155	1-136-160-00	FILM 0.039MF 5% 50V	D303	8-719-911-19	DIODE ISS119
C441	1-162-305-31	CERAMIC 0.0068MF 20% 16V	C712	1-136-161-00	FILM 0.047MF 5% 50V	C1156	1-136-157-00	FILM 0.022MF 5% 50V	D304	8-719-911-19	DIODE ISS119
C442	1-162-302-31	CERAMIC 0.0022MF 20% 16V	C713	1-131-356-00	TANTALUM 3.3MF 10% 25V	C1157	1-123-617-00	ELECT 10MF 20% 16V	D311	8-719-911-19	DIODE ISS119
C443	1-162-294-31	CERAMIC 0.001MF 10% 50V	C721	1-131-342-00	TANTALUM 0.15MF 10% 35V	C1158	1-123-612-00	ELECT 2.2MF 20% 50V	D312	8-719-911-19	DIODE ISS119
C444	1-162-291-31	CERAMIC 560PF 10% 50V	C722	1-162-596-00	CERAMIC 0.022MF 10% 25V	C1159	1-123-617-00	ELECT 10MF 20% 16V	D321	8-719-910-61	DIODE HZ6A1L
C451	1-131-371-00	TANTALUM 10MF 10% 16V	C723	1-131-356-00	TANTALUM 3.3MF 10% 25V	C1161	1-123-611-00	ELECT 1MF 20% 50V	D401	1-807-013-11	DIODE AA3422K
C452	1-131-371-00	TANTALUM 10MF 10% 16V	C731	1-136-162-00	FILM 0.056MF 5% 50V	C1162	1-162-288-31	CERAMIC 330PF 10% 50V	D402	1-807-013-11	DIODE AA3422K
C461	1-162-306-31	CERAMIC 0.01MF 30% 16V	C732	1-161-012-00	CERAMIC 0.0082MF 10% 25V	C1163	1-123-611-00	FILM 0.039MF 5% 50V	D411	1-807-013-11	DIODE AA3422K
C469	1-162-288-31	CERAMIC 330PF 10% 50V	C733	1-131-356-00	TANTALUM 3.3MF 10% 25V	C1164	1-123-611-00	ELECT 1MF 20% 50V	D412	1-807-013-11	DIODE AA3422K
C471	1-131-346-00	TANTALUM 0.68MF 10% 35V	C741	1-162-596-00	CERAMIC 0.022MF 10% 25V	C1176	1-136-160-00	FILM 0.039MF 5% 50V	D413	1-807-013-11	DIODE AA3422K
C472	1-131-344-00	TANTALUM 0.33MF 10% 35V	C742	1-162-303-31	CERAMIC 0.0033MF 30% 16V	C1177	1-123-307-00	ELECT 100MF 20% 10V	D414	1-807-013-11	DIODE AA3422K
C473	1-131-341-00	TANTALUM 0.1MF 10% 35V	C743	1-131-356-00	TANTALUM 3.3MF 10% 25V	C1178	1-123-611-00	ELECT 1MF 20% 50V	D415	1-807-013-11	DIODE AA3422K
C474	1-136-161-00	FILM 0.047MF 5% 50V	C751	1-162-306-31	CERAMIC 0.01MF 30% 16V	C1179	1-123-610-00	ELECT 0.47MF 20% 50V	D416	1-807-013-11	DIODE AA3422K
C475	1-162-306-31	CERAMIC 0.01MF 20% 16V	C752	1-162-301-31	CERAMIC 0.0015MF 30% 16V	C1181	1-136-168-00	FILM 0.18MF 5% 50V	D417	1-807-013-11	DIODE AA3422K
C476	1-162-305-31	CERAMIC 0.0068MF 20% 16V	C753	1-131-356-00	TANTALUM 3.3MF 10% 25V	C1201	1-123-612-00	ELECT 2.2MF 20% 50V	D671	8-719-911-19	DIODE ISS119
C477	1-162-303-31	CERAMIC 0.0033MF 20% 16V	C761	1-161-046-00	CERAMIC 0.0039MF 10% 25V	C1202	1-123-612-00	ELECT 2.2MF 20% 50V	D701	8-719-301-38	DIODE SEL2210S-C
C478	1-131-342-00	TANTALUM 0.15MF 10% 35V	C762	1-162-291-31	CERAMIC 560PF 10% 50V	C1203	1-123-612-00	ELECT 2.2MF 20% 50V	D702	8-719-301-38	DIODE SEL2210S-C
C479	1-136-161-00	FILM 0.047MF 5% 50V	C763	1-131-356-00	TANTALUM 3.3MF 10% 25V	C1204	1-123-612-00	ELECT 2.2MF 20% 50V	D703	8-719-301-38	DIODE SEL2210S-C
C480	1-162-596-00	CERAMIC 0.022MF 25V	C771	1-161-041-00	CERAMIC 0.0015MF 10% 25V	C1205	1-123-612-00	ELECT 2.2MF 20% 50V	D704	8-719-301-38	DIODE SEL2210S-C
C481	1-162-305-31	CERAMIC 0.0068MF 20% 16V	C772	1-162-286-31	CERAMIC 220PF 10% 50V	C1206	1-123-612-00	ELECT 2.2MF 20% 50V	D705	8-719-301-38	DIODE SEL2210S-C
C482	1-162-302-31	CERAMIC 0.0022MF 20% 16V	C773	1-131-356-00	TANTALUM 3.3MF 10% 25V	C1211	1-123-612-00	ELECT 2.2MF 20% 50V	D706	8-719-907-80	DIODE AA5535S
C483	1-162-294-31	CERAMIC 0.001MF 10% 50V	C791	1-131-371-00	TANTALUM 10MF 10% 16V	C1213	1-123-612-00	ELECT 2.2MF 20% 50V	D711	8-719-301-43	DIODE SEL2410E-C
C484	1-162-291-31	CERAMIC 560PF 10% 50V	C792	1-162-306-31	CERAMIC 4700MF 20% 42V	C1214	1-123-612-00	ELECT 2.2MF 20% 50V	D712	8-719-300-95	DIODE SEL2710K
C502	1-123-611-00	ELECT 1MF 20% 50V	C793	1-131-355-00	TANTALUM 2.2MF 10% 25V	C1215	1-123-617-00	ELECT 10MF 20% 16V	D713	8-719-301-60	DIODE SEL2910A-C
C503	1-161-055-00	CERAMIC 0.022MF 20% 25V	C901	▲1-124-362-00	ELECT 4700MF 20% 42V	C1216	1-123-617-00	ELECT 10MF 20% 16V	D714	8-719-301-52	DIODE SEL2810A-C
C504	1-123-622-00	ELECT 22MF 20% 16V	C902	▲1-124-362-00	ELECT 4700MF 20% 42V	C1218	1-123-612-00	ELECT 2.2MF 20% 50V	D715	8-719-301-38	DIODE SEL2210S-C
C505	1-123-611-00	ELECT 1MF 20% 50V	C903	1-123-338-00	ELECT 2200MF 20% 25V	C1231					

FH-150R
TA-177R

FH-150R
TA-177R

ELECTRICAL PARTS

	Ref.No.	Part No.	Description	10MF	20%	16V		
%	50V	C1109	1-123-617-00	ELECT	10MF	20%	16V	
%	50V	C1111	1-123-611-00	ELECT	1MF	20%	50V	
%	50V	C1112	1-162-288-31	CERAMIC	330PF	10%	50V	
%	50V	C1125	1-162-199-11	CERAMIC	10PF	10%	50V	
%	10V	C1126	1-136-160-00	FILM	0.039MF	5%	50V	
%	10V	C1127	1-123-307-00	ELECT	100MF	20%	10V	
%	16V	C1128	1-123-611-00	ELECT	1MF	20%	50V	
%	10V	C1129	1-123-610-00	ELECT	0.47MF	20%	50V	
%	50V	C1131	1-136-168-00	FILM	0.18MF	5%	50V	
%	10V	C1151	1-123-612-00	ELECT	2.2MF	20%	50V	
30%	25V	C1152	1-136-165-00	FILM	0.1MF	5%	50V	
30%	16V	C1153	1-136-165-00	FILM	0.1MF	5%	50V	
%	25V	C1154	1-162-282-31	CERAMIC	100PF	10%	50V	
%	16V	C1155	1-136-160-00	FILM	0.039MF	5%	50V	
%	35V	C1156	1-136-157-00	FILM	0.022MF	5%	50V	
%	50V	C1157	1-123-617-00	ELECT	10MF	20%	16V	
%	25V	C1158	1-123-612-00	ELECT	2.2MF	20%	50V	
%	35V	C1159	1-123-617-00	ELECT	10MF	20%	16V	
%	25V	C1161	1-123-611-00	ELECT	1MF	20%	50V	
%	25V	C1162	1-162-288-31	CERAMIC	330PF	10%	50V	
%	50V	C1175	1-162-199-11	CERAMIC	10PF	10%	50V	
%	25V	C1176	1-136-160-00	FILM	0.039MF	5%	50V	
%	25V	C1177	1-123-307-00	ELECT	100MF	20%	10V	
%	25V	C1178	1-123-611-00	ELECT	1MF	20%	50V	
%	16V	C1179	1-123-610-00	ELECT	0.47MF	20%	50V	
%	16V	C1181	1-136-168-00	FILM	0.18MF	5%	50V	
%	16V	C1201	1-123-612-00	ELECT	2.2MF	20%	50V	
%	16V	C1202	1-123-612-00	ELECT	2.2MF	20%	50V	
%	25V	C1203	1-123-612-00	ELECT	2.2MF	20%	50V	
%	25V	C1204	1-123-612-00	ELECT	2.2MF	20%	50V	
%	50V	C1205	1-123-612-00	ELECT	2.2MF	20%	50V	
%	25V	C1206	1-123-612-00	ELECT	2.2MF	20%	50V	
%	25V	C1211	1-123-612-00	ELECT	2.2MF	20%	50V	
%	50V	C1213	1-123-612-00	ELECT	2.2MF	20%	50V	
%	25V	C1214	1-123-612-00	ELECT	2.2MF	20%	50V	
%	16V	C1215	1-123-617-00	ELECT	10MF	20%	16V	
%	16V	C1216	1-123-617-00	ELECT	10MF	20%	16V	
%	42V	C1218	1-123-612-00	ELECT	2.2MF	20%	50V	
%	42V	C1231	1-162-306-31	CERAMIC	0.01MF	30%	16V	
%	25V	C1232	1-123-617-00	ELECT	10MF	20%	16V	
%	50V	C1233	1-136-165-00	FILM	0.1MF	5%	50V	
%	25V	C1501	1-161-330-00	(G-AEP)...	CERAMIC	0.01MF	30%	25V
%	25V	C1502	1-161-330-00	(G-AEP)...	CERAMIC	0.01MF	30%	25V
%	10V	C1503	1-161-330-00	(G-AEP)...	CERAMIC	0.01MF	30%	25V
%	50V	CN201	*1-560-061-00	PIN, CONNECTOR 3P				
%	250V	CN202	*1-560-064-00	PIN, CONNECTOR 6P				
%	400V	CN203	*1-560-063-00	PIN, CONNECTOR 5P				
%	50V	CN204	*1-560-066-00	PIN, CONNECTOR 10P				
%	50V	CN205	*1-560-060-00	PIN, CONNECTOR 2P				
%	50V	CN206	*1-560-065-00	PIN, CONNECTOR 8P				
%	50V	CN208	*1-564-496-11	PIN, CONNECTOR 3P				
%	50V	CN216	*1-560-062-00	PIN, CONNECTOR 4P				
%	50V	CN217	*1-560-603-00	PIN, CONNECTOR 4P				
%	50V	CN401	*1-564-501-11	PIN, CONNECTOR 8P				
%	16V	CN402	*1-564-496-11	PIN, CONNECTOR 3P				
%	50V	CN403	*1-564-112-21	PIN, CONNECTOR 3P				

ELECTRICAL PARTS

	Ref.No.	Part No.	Description	10MF	20%	16V
%		CN601	*1-560-070-00	BASE POST 5P		
%		CN603	*1-560-070-00	BASE POST 5P		
%		CN903	*1-560-063-00	PIN, CONNECTOR 5P		
%		CN1101	*1-564-506-11	PLUG, CONNECTOR 3P		
%		CN1102	*1-564-507-11	PLUG, CONNECTOR 4P		
%		CN1103	*1-564-338-00	PIN, CONNECTOR 4P		
%		D755	8-719-301-38	DIODE SEL2210S-C		
%		D761	8-719-301-43	DIODE SEL2410E-C		
%		D762	8-719-300-95	DIODE SEL2710K		
%		D763	8-719-301-60	DIODE SEL2910A-C		
%		D764	8-719-301-52	DIODE SEL2810A-C		
%		D765	8-719-301-38	DIODE SEL2210S-C		
%		D771	8-719-301-43	DIODE SEL2410E-C		
%		D772	8-719-300-95	DIODE SEL2710K		
%		D773	8-719-301-60	DIODE SEL2910A-C		
%		D774	8-719-301-52	DIODE SEL2810A-C		
%		D775	8-719-301-38	DIODE SEL2210S-C		
%		D781	8-719-301-52	DIODE SEL2810A-C		
%		D782	8-719-301-52	DIODE SEL2810A-C		
%		D783	8-719-301-52	DIODE SEL2810A-C		
%		D784	8-719-301-52	DIODE SEL2810A-C		
%		D791	8-719-901-62	DIODE HZ16-2L		
%		D901	A-8-719-300-67	DIODE RB602F		
%		D902	A-8-719-300-57	DIODE RB402		
%		D904	8-719-911-19	DIODE ISS119		
%		D910	8-719-904-21	DIODE HZ12A1		
%		D915	8-719-904-21	DIODE HZ12A1		
%		D920	8-719-910-71	DIODE HZ7A1L		
%		D1101	8-719-911-19	DIODE ISS119		
%		D1102	8-719-911-19	DIODE ISS119		
%		D1125	8-719-910-61	DIODE HZ6A1L		
%		D1151	8-719-911-19	DIODE ISS119		
%		D1152	8-719-911-19	DIODE ISS119		
%		D1175	8-719-910-61	DIODE HZ6A1L		
%		D1231	8-719-911-19	DIODE ISS119		
%		D1232	8-719-911-19	DIODE ISS119		
%		D1301	8-719-403-98	DIODE LN450YP		
%		F901	A-1-532-285-00	FUSE, TIME-LAG, 1.25A		
%		F902	A-1-532-285-00	(EA3,E)...FUSE, TIME-LAG, 1.25A		
%		IC101	8-759-602-54	IC CX20106A		
%		IC102	8-759-600-02	IC M5218L		
%		IC201	8-759-600-02	IC M5218L		
%		D711	8-719-301-43	DIODE SEL2410E-C		
%		D712	8-719-300-95	DIODE SEL2710K		
%		D713	8-719-301-60	DIODE SEL2910A-C		
%		D714	8-719-301-52	DIODE SEL2810A-C		
%		D715	8-719-301-38	DIODE SEL2210S-C		
%		D721	8-719-301-43	DIODE SEL2410E-C		
%		D				

ELECTRICAL PARTS

Ref.No.	Part No.	Description
R117	1-247-831-00	CARBON
R151	1-247-891-00	CARBON
R152	1-247-831-00	CARBON
R153	1-247-873-00	CARBON
R154	1-247-831-00	CARBON
R155	1-249-437-11	CARBON
R156	1-247-901-00	CARBON
R161	1-247-831-00	CARBON
R165	1-247-891-00	CARBON
R166	1-247-843-00	CARBON
R167	1-247-831-00	CARBON
R202	1-247-831-00	CARBON
R203	1-247-831-00	CARBON
R204	1-247-853-00	CARBON
R205	1-247-831-00	CARBON
R206	1-247-849-00	CARBON
R207	1-247-891-00	CARBON
R208	1-247-891-00	CARBON
R209	1-247-891-00	CARBON
R210	1-249-434-11	CARBON
R211	1-247-849-00	CARBON
R212	1-247-873-00	CARBON
R214	1-249-425-11	CARBON
R215	1-249-425-11	CARBON
R218	1-249-441-11	CARBON
R231	1-247-903-00	CARBON
R252	1-247-831-00	CARBON
R253	1-247-831-00	CARBON
R254	1-247-853-00	CARBON
R255	1-247-831-00	CARBON
R256	1-247-849-00	CARBON
R257	1-247-891-00	CARBON
R258	1-247-891-00	CARBON
R259	1-247-891-00	CARBON
R260	1-249-434-11	CARBON
R261	1-247-849-00	CARBON
R262	1-247-873-00	CARBON
R264	1-249-425-11	CARBON
R265	1-249-425-11	CARBON
R268	1-249-441-11	CARBON
R281	1-247-903-00	CARBON
R305	1-247-843-00	CARBON
R306	1-249-433-11	CARBON
R307	1-247-831-00	CARBON
R312	1-249-425-11	CARBON
R313	1-249-429-11	CARBON
R315	1-249-429-11	CARBON
R316	1-249-429-11	CARBON
R321	1-249-429-11	CARBON
R322	1-249-429-11	CARBON
R323	1-249-429-11	CARBON
R331	1-249-441-11	CARBON
R332	1-247-903-00	CARBON
R333	1-247-843-00	CARBON
R335	1-249-441-11	CARBON
R336	1-247-831-00	CARBON
R340	1-247-843-00	CARBON

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R341	1-247-843-00	CARBON	3.3K	5%	1/6W
R342	1-247-843-00	CARBON	3.3K	5%	1/6W
R343	1-247-843-00	CARBON	3.3K	5%	1/6W
R345	1-249-429-11	CARBON	10K	5%	1/6W
R346	1-249-429-11	CARBON	10K	5%	1/6W
R347	1-249-429-11	CARBON	10K	5%	1/6W
R348	1-249-429-11	CARBON	10K	5%	1/6W
R350	1-249-441-11	CARBON	100K	5%	1/6W
R351	1-249-429-11	CARBON	10K	5%	1/6W
R352	1-249-429-11	CARBON	10K	5%	1/6W
R353	1-249-429-11	CARBON	10K	5%	1/6W
R354	1-249-429-11	CARBON	10K	5%	1/6W
R355	1-249-429-11	CARBON	10K	5%	1/6W
R356	1-249-441-11	CARBON	100K	5%	1/6W
R357	1-247-891-00	CARBON	330K	5%	1/6W
R358	1-249-441-11	CARBON	100K	5%	1/6W
R361	1-249-429-11	CARBON	10K	5%	1/6W
R362	1-249-429-11	CARBON	10K	5%	1/6W
R363	1-249-429-11	CARBON	10K	5%	1/6W
R371	1-249-429-11	CARBON	10K	5%	1/6W
R372	1-249-429-11	CARBON	10K	5%	1/6W
R373	1-249-429-11	CARBON	10K	5%	1/6W
R380	1-249-429-11	CARBON	10K	5%	1/6W
R381	1-249-425-11	CARBON	4.7K	5%	1/6W
R382	1-247-873-00	CARBON	56K	5%	1/6W
R385	1-249-429-11	CARBON	10K	5%	1/6W
R386	1-249-425-11	CARBON	4.7K	5%	1/6W
R391	1-249-414-11	CARBON	560	5%	1/6W
R392	1-249-414-11	CARBON	560	5%	1/6W
R394	1-247-831-00	CARBON	1K	5%	1/6W
R395	1-249-429-11	CARBON	10K	5%	1/6W
R396	1-249-429-11	CARBON	10K	5%	1/6W
R397	1-249-429-11	CARBON	10K	5%	1/6W
R398	1-249-429-11	CARBON	10K	5%	1/6W
R399	1-249-429-11	CARBON	10K	5%	1/6W
R411	1-249-425-11	CARBON	4.7K	5%	1/6W
R412	1-249-437-11	CARBON	47K	5%	1/6W
R413	1-249-425-11	CARBON	4.7K	5%	1/6W
R421	1-249-425-11	CARBON	4.7K	5%	1/6W
R422	1-249-437-11	CARBON	47K	5%	1/6W
R423	1-249-425-11	CARBON	4.7K	5%	1/6W
R461	1-249-429-11	CARBON	10K	5%	1/6W
R491	1-247-823-00	CARBON	470	5%	1/6W
R501	1-249-429-11	CARBON	10K	5%	1/6W
R502	1-249-414-11	CARBON	560	5%	1/6W
R503	1-249-432-11	CARBON	18K	5%	1/6W
R504	1-249-440-11	CARBON	82K	5%	1/6W
R505	1-249-425-11	CARBON	4.7K	5%	1/6W
R506	1-247-831-00	CARBON	1K	5%	1/6W
R601	1-247-873-00	CARBON	56K	5%	1/6W
R602	1-249-421-11	CARBON	2.2K	5%	1/6W
R603	1-249-421-11	CARBON	2.2K	5%	1/6W
R604	1-247-873-00	CARBON	56K	5%	1/6W
R605	▲1-247-717-11	CARBON	2.2K	5%	1/4W
R606	▲1-247-717-11	CARBON	2.2K	5%	1/4W
R607	▲1-217-151-00	METAL PLATE	0.22	10%	2W
R608	1-249-414-11	CARBON	560	5%	1/6W

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Value	Tolerance	Power
R609	1-249-414-11	CARBON	560	5%	1/6W
R611 Δ	1-247-192-00	CARBON	10	5%	1/2W F
R631 Δ	1-217-399-00	FUSIBLE	100	5%	1/4W F
R632 Δ	1-247-240-00	CARBON	1K	5%	1/2W F
R633 Δ	1-247-240-00	CARBON	1K	5%	1/2W F
R634 Δ	1-212-883-00	FUSIBLE	120	5%	1/4W F
R635 Δ	1-217-399-00	FUSIBLE	100	5%	1/4W F
R641	1-247-849-00	CARBON	5.6K	5%	1/6W
R651	1-247-873-00	CARBON	56K	5%	1/6W
R652	1-249-421-11	CARBON	2.2K	5%	1/6W
R653	1-249-421-11	CARBON	2.2K	5%	1/6W
R654	1-247-873-00	CARBON	56K	5%	1/6W
R655 Δ	1-247-717-11	CARBON	2.2K	5%	1/4W
R656 Δ	1-247-717-11	CARBON	2.2K	5%	1/4W
R657 Δ	1-217-151-00	METAL PLATE	0.22	10%	2W
R658	1-249-414-11	CARBON	560	5%	1/6W
R659	1-249-414-11	CARBON	560	5%	1/6W
R661 Δ	1-247-192-00	CARBON	10	5%	1/2W F
R671	1-249-433-11	CARBON	22K	5%	1/6W
R672	1-249-429-11	CARBON	10K	5%	1/6W
R673	1-249-433-11	CARBON	22K	5%	1/6W
R674	1-249-433-11	CARBON	22K	5%	1/6W
R675	1-247-881-00	CARBON	120K	5%	1/6W
R676	1-247-881-00	CARBON	120K	5%	1/6W
R677	1-249-441-11	CARBON	100K	5%	1/6W
R678 Δ	1-247-220-00	CARBON	150	5%	1/2W F
R679	1-249-429-11	CARBON	10K	5%	1/6W
R680	1-247-873-00	CARBON	56K	5%	1/6W
R691	1-247-849-00	CARBON	5.6K	5%	1/6W
R701	1-249-414-11	CARBON	560	5%	1/6W
R702	1-249-425-11	CARBON	4.7K	5%	1/6W
R703	1-249-435-11	CARBON	33K	5%	1/6W
R704	1-247-833-00	CARBON	1.2K	5%	1/6W
R705	1-249-419-11	CARBON	1.5K	5%	1/6W
R711	1-249-425-11	CARBON	4.7K	5%	1/6W
R712	1-247-875-00	CARBON	68K	5%	1/6W
R716	1-247-813-00	CARBON	180	5%	1/6W
R721	1-249-425-11	CARBON	4.7K	5%	1/6W
R722	1-247-875-00	CARBON	68K	5%	1/6W
R726	1-247-813-00	CARBON	180	5%	1/6W
R731	1-249-425-11	CARBON	4.7K	5%	1/6W
R732	1-247-875-00	CARBON	68K	5%	1/6W
R736	1-247-813-00	CARBON	180	5%	1/6W
R741	1-249-425-11	CARBON	4.7K	5%	1/6W
R742	1-247-875-00	CARBON	68K	5%	1/6W
R746	1-247-813-00	CARBON	180	5%	1/6W
R751	1-249-425-11	CARBON	4.7K	5%	1/6W
R752	1-247-875-00	CARBON	68K	5%	1/6W
R756	1-247-813-00	CARBON	180	5%	1/6W
R761	1-249-425-11	CARBON	4.7K	5%	1/6W
R762	1-247-875-00	CARBON	68K	5%	1/6W
R766	1-247-813-00	CARBON	180	5%	1/6W
R771	1-249-425-11	CARBON	4.7K	5%	1/6W
R772	1-247-875-00	CARBON	68K	5%	1/6W
R776	1-247-813-00	CARBON	180	5%	1/6W
R781	1-247-819-00	CARBON	330	5%	1/6W
R782	1-247-819-00	CARBON	330	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Value	Tolerance	Power
R783	1-247-819-00	CARBON	330	5%	1/6W
R784	1-247-819-00	CARBON	330	5%	1/6W
R785	1-247-819-00	CARBON	330	5%	1/6W
R786	1-247-819-00	CARBON	330	5%	1/6W
R787	1-247-831-00	CARBON	1K	5%	1/6W
R791	1-247-719-11	CARBON	3.3K	5%	1/4W
R792	1-247-719-11	CARBON	3.3K	5%	1/4W
R793	1-249-414-11	CARBON	560	5%	1/6W
R796	1-247-831-00	CARBON	1K	5%	1/6W
R797	1-249-429-11	CARBON	10K	5%	1/6W
R798	1-249-429-11	CARBON	10K	5%	1/6W
R799	1-249-429-11	CARBON	10K	5%	1/6W
R801 Δ	1-247-711-11	CARBON	680	5%	1/4W F
R802 Δ	1-247-711-11	CARBON	680	5%	1/4W F
R903 Δ	1-217-422-00	FUSIBLE	1	5%	1/2W F
R904	1-247-849-00	CARBON	5.6K	5%	1/6W
R905 Δ	1-217-422-00	FUSIBLE	1	5%	1/2W F
R906 Δ	1-217-482-00	FUSIBLE	12	5%	1W F
R910 Δ	1-207-934-00	WIREWOUND	120	10%	5W F
R911	1-249-425-11	CARBON	4.7K	5%	1/6W
R912	1-249-429-11	CARBON	10K	5%	1/6W
R915 Δ	1-207-686-00	WIREWOUND	100	10%	5W F
R916	1-249-425-11	CARBON	4.7K	5%	1/6W
R917	1-249-429-11	CARBON	10K	5%	1/6W
R920 Δ	1-213-131-00	METAL OXIDE	100	5%	1W F
R921	1-249-421-11	CARBON	2.2K	5%	1/6W
R1101	1-247-895-00	CARBON	470K	5%	1/6W
R1102	1-247-887-00	CARBON	220K	5%	1/6W
R1103	1-249-425-11	CARBON	4.7K	5%	1/6W
R1104	1-247-815-00	CARBON	220	5%	1/6W
R1105	1-249-440-11	CARBON	82K	5%	1/6W
R1106	1-247-857-00	CARBON	12K	5%	1/6W
R1107	1-247-851-00	CARBON	6.8K	5%	1/6W
R1108	1-247-831-00	CARBON	1K	5%	1/6W
R1109	1-247-869-00	CARBON	39K	5%	1/6W
R1110	1-247-845-00	CARBON	3.9K	5%	1/6W
R1111	1-247-875-00	CARBON	68K	5%	1/6W
R1112	1-247-833-00	CARBON	1.2K	5%	1/6W
R1113	1-247-895-00	CARBON	470K	5%	1/6W
R1114	1-247-903-00	CARBON	1M	5%	1/6W
R1115	1-247-841-00	CARBON	2.7K	5%	1/6W
R1116	1-249-433-11	CARBON	22K	5%	1/6W
R1117	1-247-815-00	CARBON	220	5%	1/6W
R1118	1-247-851-00	CARBON	6.8K	5%	1/6W
R1119	1-249-421-11	CARBON	2.2K	5%	1/6W
R1121	1-247-831-00	CARBON	1K	5%	1/6W
R1125	1-247-819-00	CARBON	330	5%	1/6W
R1126	1-247-831-00	CARBON	1K	5%	1/6W
R1127	1-249-429-11	CARBON	10K	5%	1/6W
R1128	1-249-405-11	CARBON	100	5%	1/6W
R1129	1-249-435-11	CARBON	33K	5%	1/6W
R1131	1-249-435-11	CARBON	33K	5%	1/6W
R1132	1-247-813-00	CARBON	180	5%	1/6W
R1133	1-247-706-11	CARBON	330	5%	1/4W
R1134	1-249-433-11	CARBON	22K	5%	1/6W
R1135	1-247-815-00	CARBON	220	5%	1/6W
R1136	1-247-809-00	CARBON	120	5%	1/6W

The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description	1M	5%	1/6W
R1137	1-247-903-00	CARBON			
R1138	1-247-831-00	CARBON	1K	5%	1/6W
R1148	1-249-441-11	CARBON	100K	5%	1/6W
R1149	1-249-405-11	CARBON	100	5%	1/6W
R1151	1-247-895-00	CARBON	470K	5%	1/6W
R1152	1-247-887-00	CARBON	220K	5%	1/6W
R1153	1-249-425-11	CARBON	4.7K	5%	1/6W
R1154	1-247-815-00	CARBON	220	5%	1/6W
R1155	1-249-440-11	CARBON	82K	5%	1/6W
R1156	1-247-857-00	CARBON	12K	5%	1/6W
R1157	1-247-851-00	CARBON	6.8K	5%	1/6W
R1158	1-247-831-00	CARBON	1K	5%	1/6W
R1159	1-247-869-00	CARBON	39K	5%	1/6W
R1160	1-247-845-00	CARBON	3.9K	5%	1/6W
R1161	1-247-875-00	CARBON	68K	5%	1/6W
R1162	1-247-833-00	CARBON	1.2K	5%	1/6W
R1163	1-247-895-00	CARBON	470K	5%	1/6W
R1164	1-247-903-00	CARBON	1M	5%	1/6W
R1165	1-247-841-00	CARBON	2.7K	5%	1/6W
R1166	1-249-433-11	CARBON	22K	5%	1/6W
R1167	1-247-815-00	CARBON	220	5%	1/6W
R1168	1-247-851-00	CARBON	6.8K	5%	1/6W
R1169	1-249-421-11	CARBON	2.2K	5%	1/6W
R1171	1-247-831-00	CARBON	1K	5%	1/6W
R1175	1-247-819-00	CARBON	330	5%	1/6W
R1176	1-247-831-00	CARBON	1K	5%	1/6W
R1177	1-249-429-11	CARBON	10K	5%	1/6W
R1178	1-249-405-11	CARBON	100	5%	1/6W
R1179	1-249-435-11	CARBON	33K	5%	1/6W
R1181	1-249-435-11	CARBON	33K	5%	1/6W
R1182	1-247-813-00	CARBON	180	5%	1/6W
R1183	1-247-706-11	CARBON	330	5%	1/4W
R1184	1-249-433-11	CARBON	22K	5%	1/6W
R1185	1-247-815-00	CARBON	220	5%	1/6W
R1186	1-247-809-00	CARBON	120	5%	1/6W
R1187	1-247-903-00	CARBON	1M	5%	1/6W
R1188	1-247-831-00	CARBON	1K	5%	1/6W
R1199	1-249-405-11	CARBON	100	5%	1/6W
R1231	1-247-833-00	CARBON	1.2K	5%	1/6W
R1232	1-247-815-00	CARBON	220	5%	1/6W
R1233	1-247-815-00	CARBON	220	5%	1/6W
R1235	1-249-433-11	CARBON	22K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description	22K	5%	1/6W
R1236	1-249-433-11	CARBON			
R1237	1-249-433-11	CARBON	22K	5%	1/6W
R1238	1-249-429-11	CARBON	10K	5%	1/6W
R1239	1-249-433-11	CARBON	22K	5%	1/6W
R1241	1-247-831-00	CARBON	1K	5%	1/6W
R1245	1-247-831-00	CARBON	1K	5%	1/6W
R1246	1-247-831-00	CARBON	1K	5%	1/6W
R1247	1-247-831-00	CARBON	1K	5%	1/6W
R1501	1-247-688-11	(G-AEP)...CARBON	10	5%	1/4W
R1502	1-247-688-11	(G-AEP)...CARBON	10	5%	1/4W
RV401	1-230-813-31	RES, VAR, SLIDE 250K/250K (BALANCE), including D401			
RV402	1-237-243-31	RES, VAR, SLIDE 50K/50K (MIC LEVEL), including D402			
RV411	1-230-813-31	RES, VAR, SLIDE 250K/250K (63Hz), including D411			
RV412	1-230-813-31	RES, VAR, SLIDE 250K/250K (150Hz), including D412			
RV413	1-230-813-31	RES, VAR, SLIDE 250K/250K (400Hz), including D413			
RV414	1-230-813-31	RES, VAR, SLIDE 250K/250K (1kHz), including D414			
RV415	1-230-813-31	RES, VAR, SLIDE 250K/250K (3kHz), including D415			
RV416	1-230-813-31	RES, VAR, SLIDE 250K/250K (6kHz), including D416			
RV417	1-230-813-31	RES, VAR, SLIDE 250K/250K (14kHz), including D417			
RY601	1-515-503-00	RELAY			
SW701	1-554-303-21	SWITCH, KEY BOARD (VOLUME UP)			
SW702	1-554-303-21	SWITCH, KEY BOARD (VOLUME DOWN)			
SW703	1-554-303-21	SWITCH, KEY BOARD (MUTING-20dB)			
SW704	1-554-303-21	SWITCH, KEY BOARD (PHONO)			
SW705	1-554-303-21	SWITCH, KEY BOARD (TVNER)			
SW706	1-554-303-21	SWITCH, KEY BOARD (CD/AUX)			
SW707	1-554-303-21	SWITCH, KEY BOARD (TAPE)			
ASW1001.1-553-318-51 SWITCH, PUSH (AC POWER)(1 KEY), POWER					
ASW1002.1-526-576-51 (EA3,E)...SELECTOR, POWER VOLTAGE					
SW1201 1-554-419-00 SWITCH, PUSH (1 KEY)(AMFB)					
T1001A.1-448-133-11 (EA3,E)...TRANSFORMER, POWER					
T1001A.1-448-134-11 (G-AEP,AEP,UK,AED)...TRANSFORMER, POWER					

The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

FH-150R
TC-177R

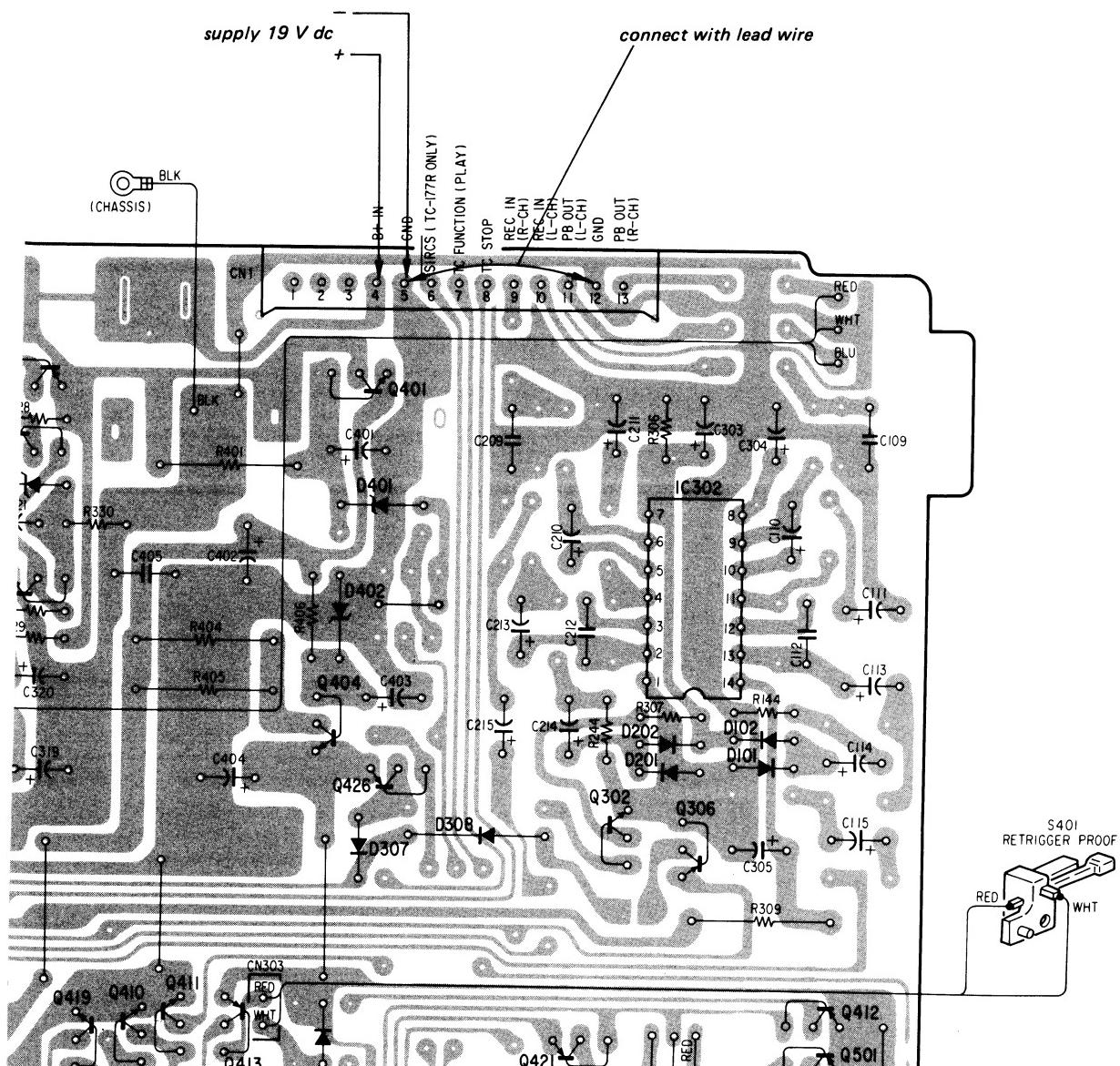
STEREO CASSETTE DECK

(TC-177R)

Tape Transport Mechanism Type	TCM-150R10
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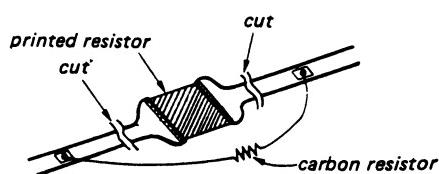
SERVICING NOTE

- Voltage measurement should be made under the following condition.



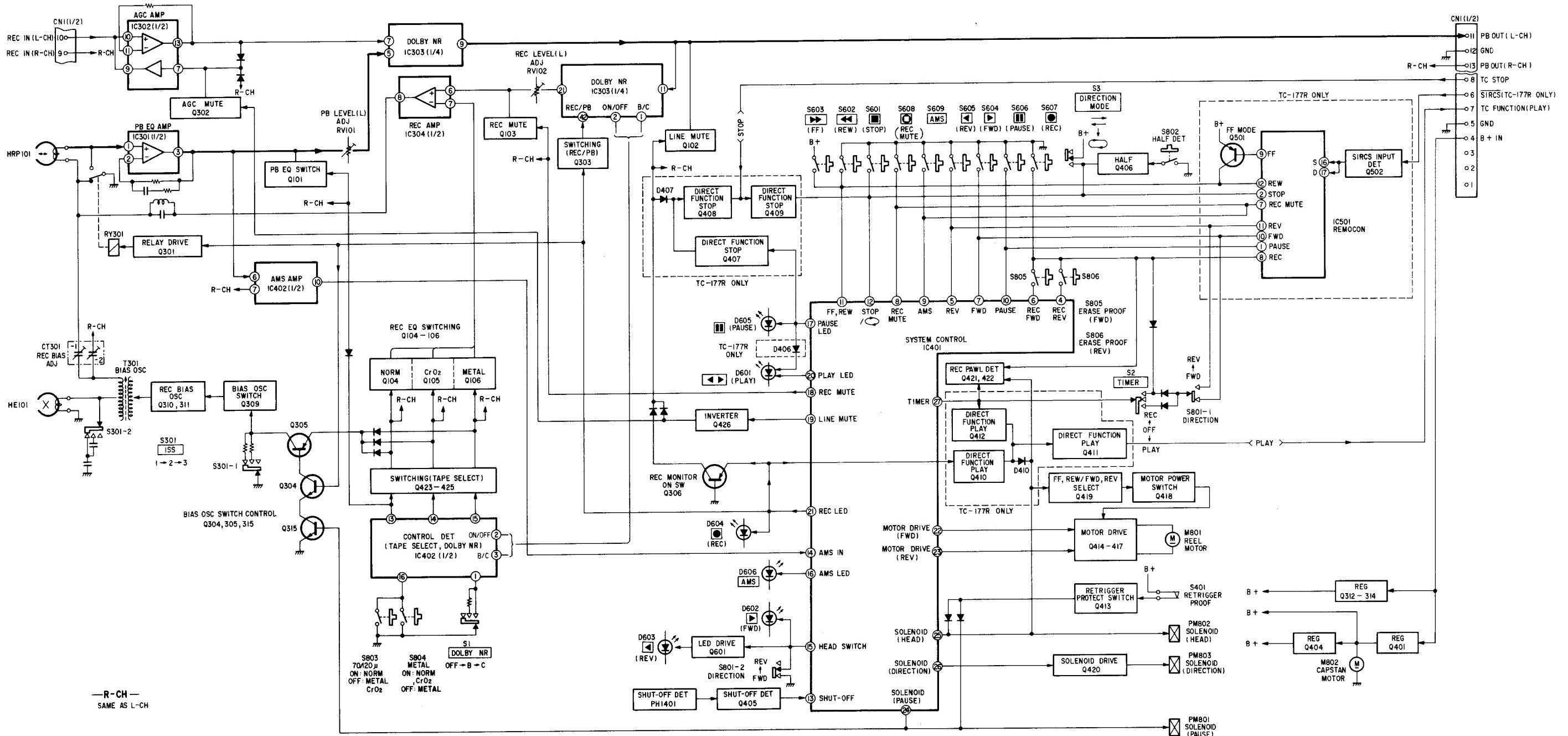
• **Repairing printed resistor**

Cut both sides of the resistor and solder the carbon resistor having same value in place of printed one on the conductor side.



SECTION 1
BLOCK DIAGRAM

FH-150R FH-150R
TC-177R TC-177R



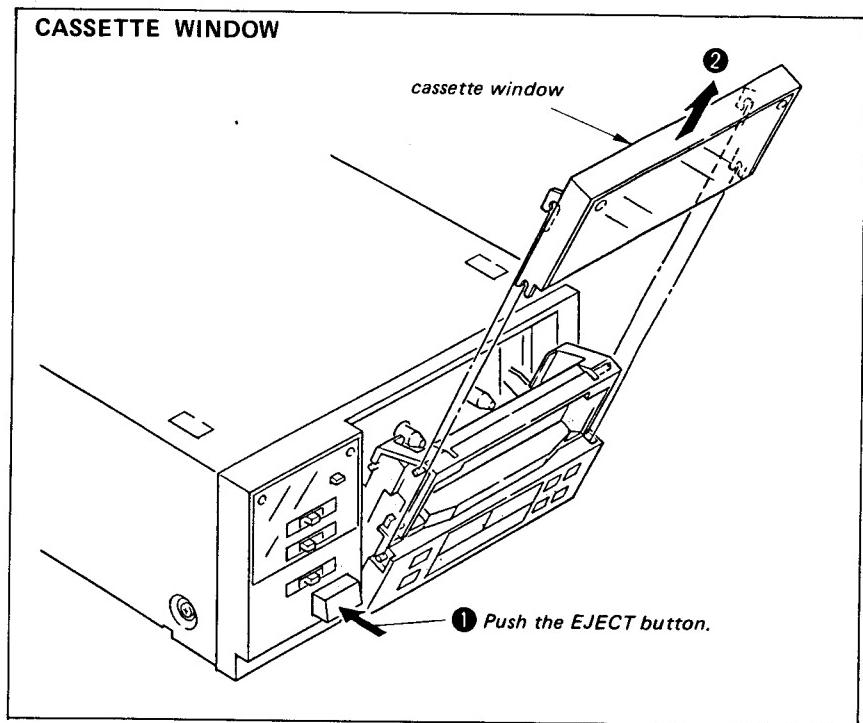
SECTION 2
DISASSEMBLY

FH-150R **FH-150R**
TC-177R **TC-177R**

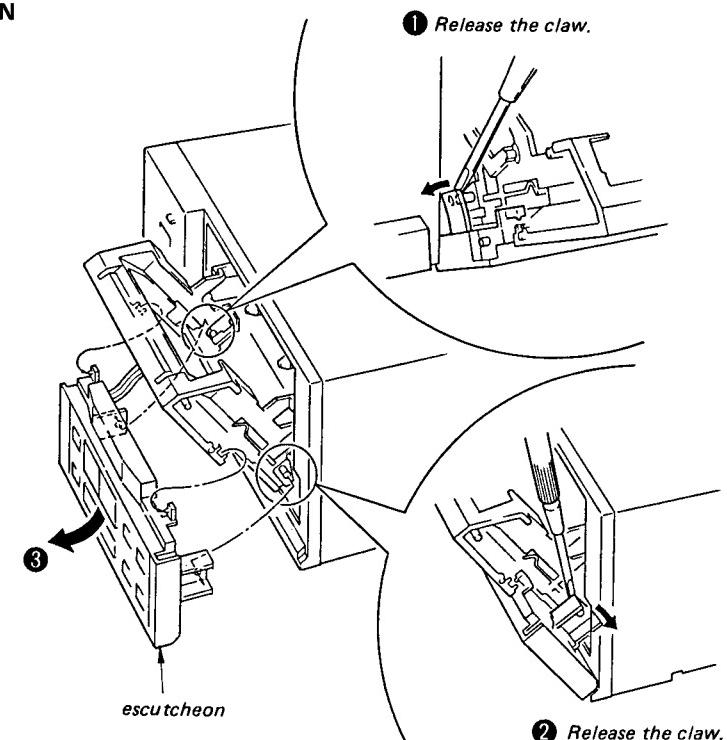
Note: Follow the disassembly procedure in the numerical order given.

CASE REMOVAL

Remove case by taking out four screws securing case.



ESCUTCHEON

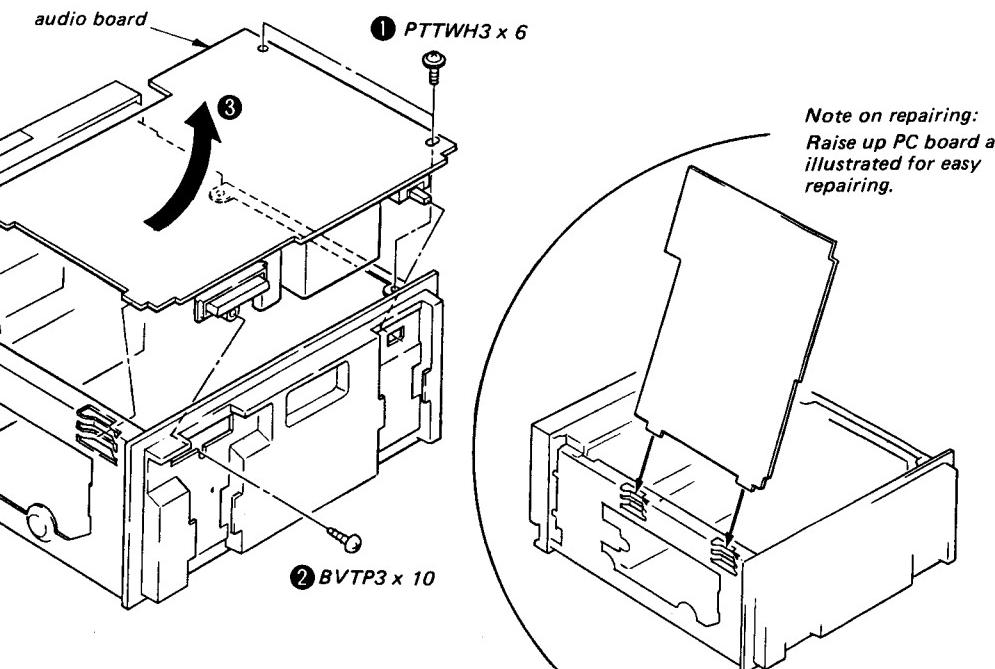


1 Release the claw.

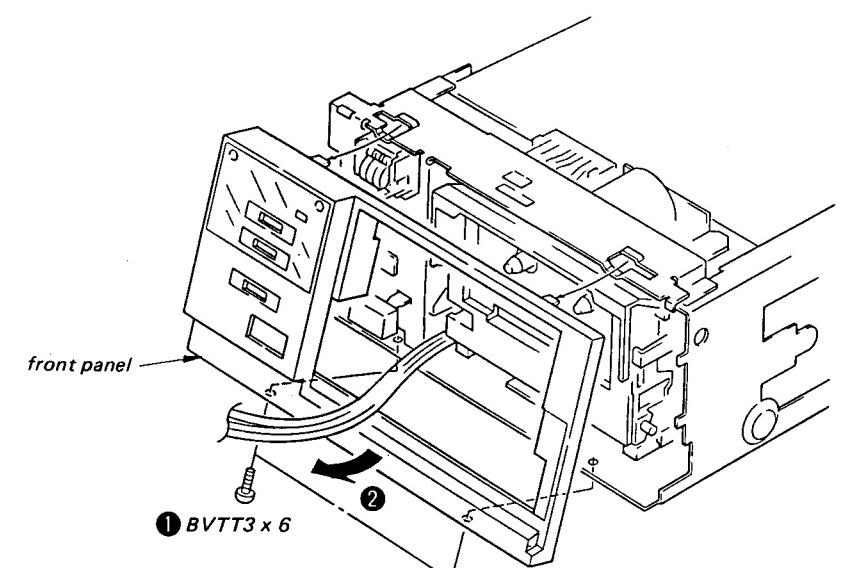
2 Release the claw.

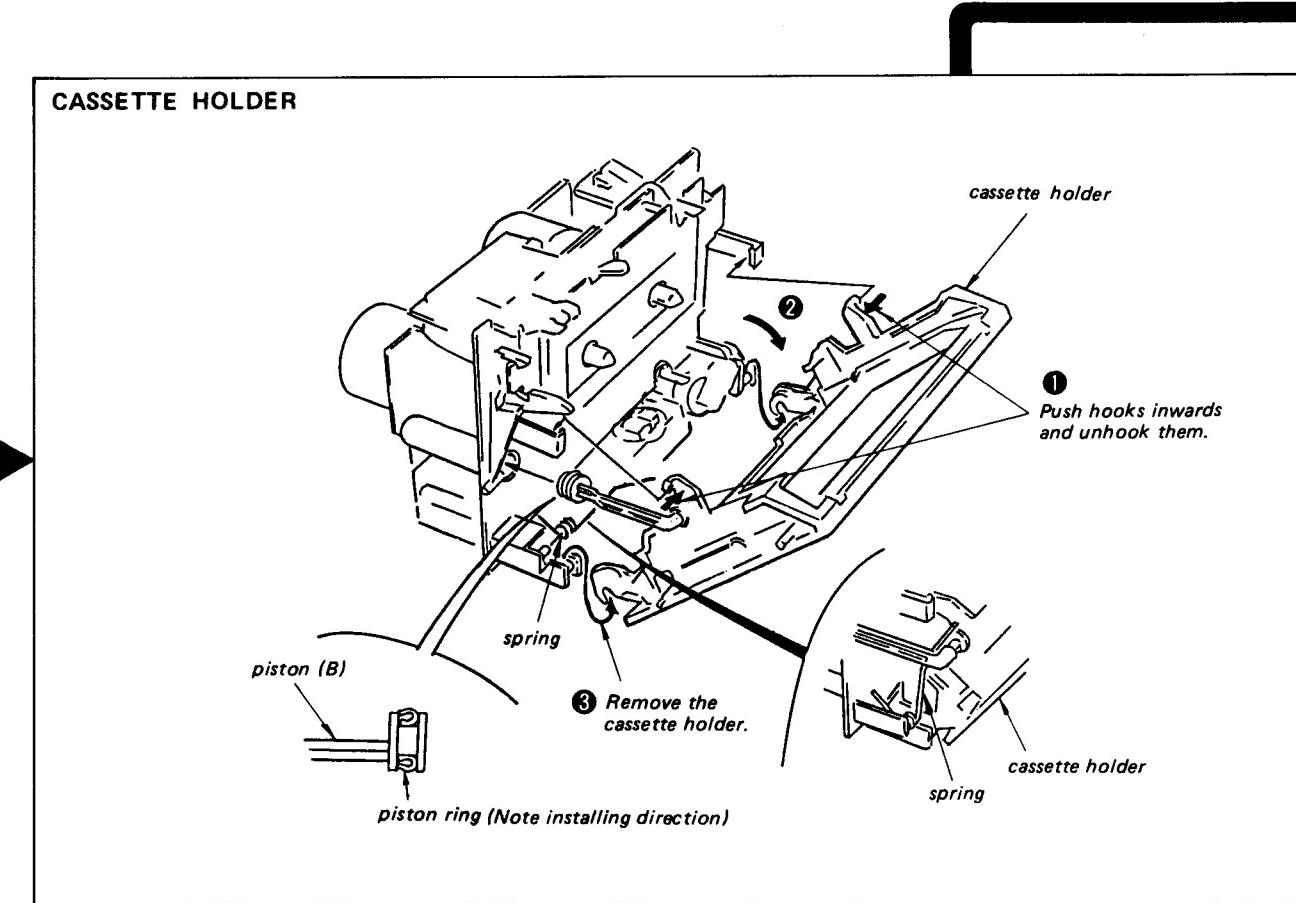
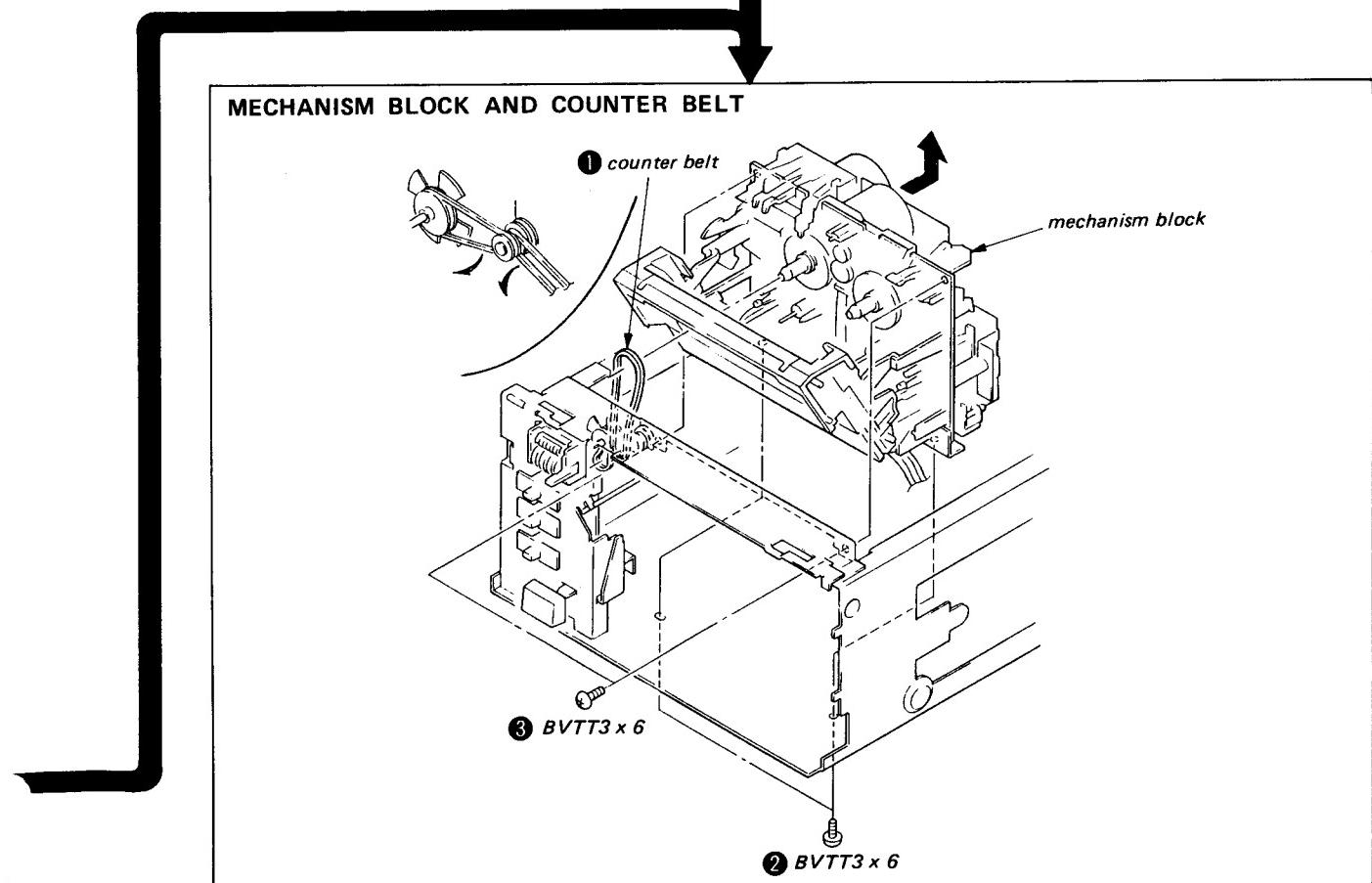
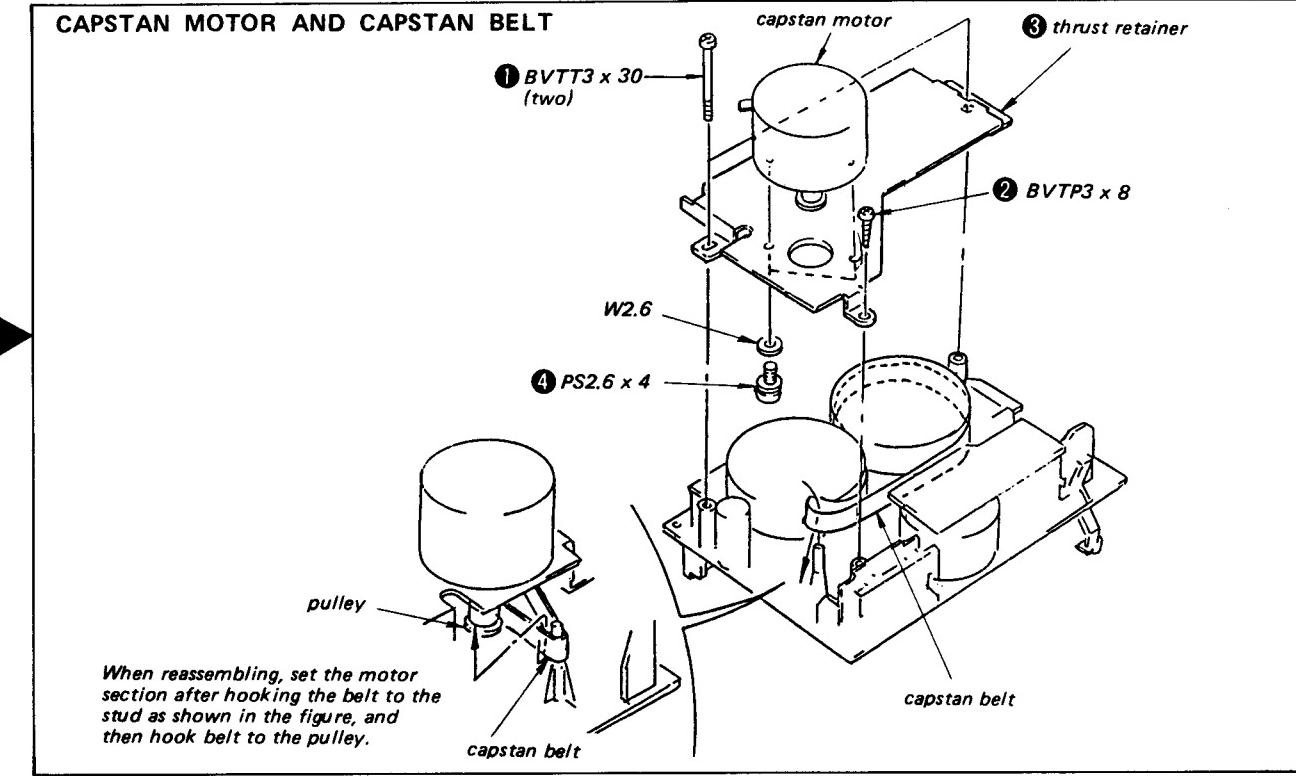
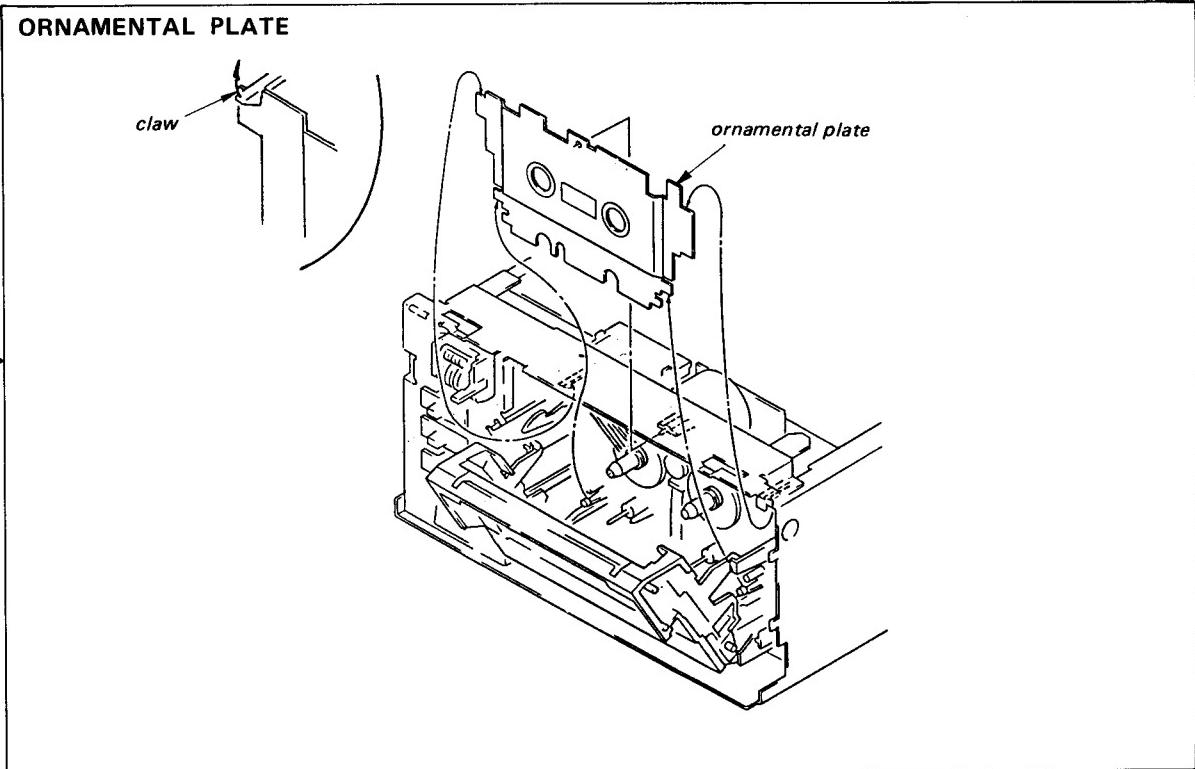


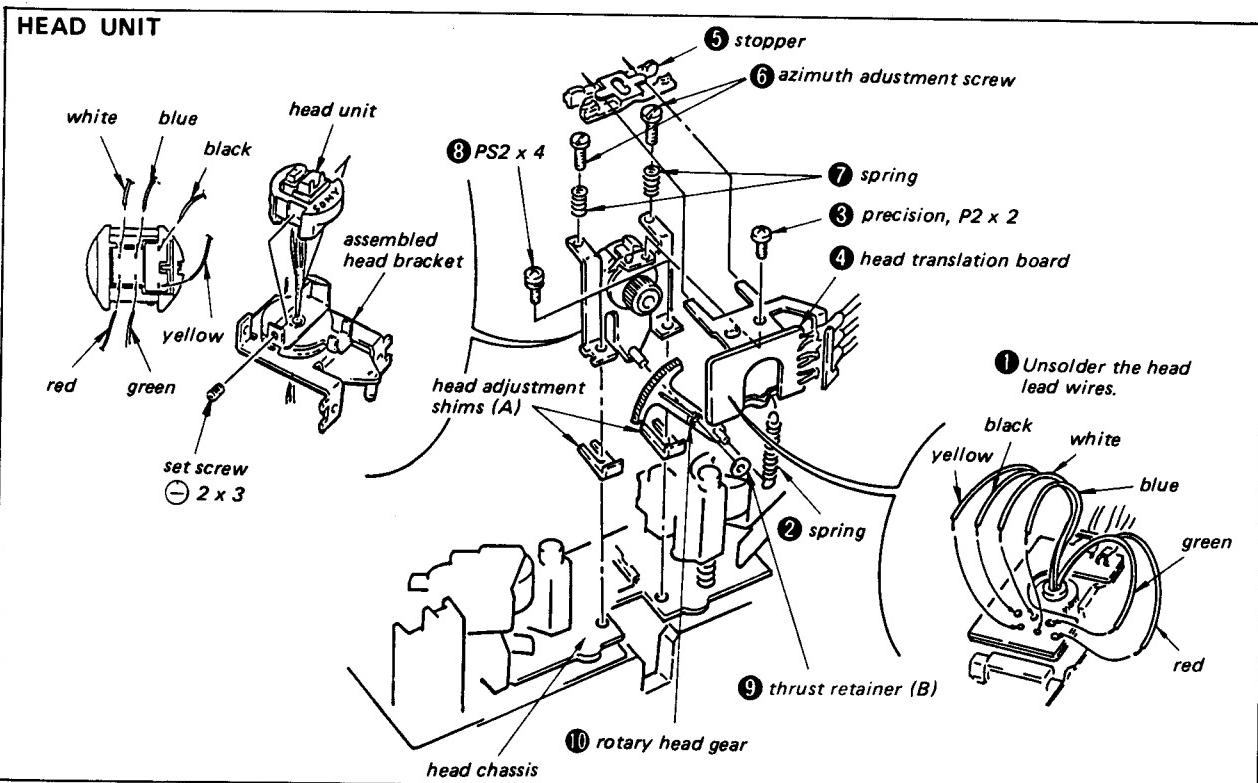
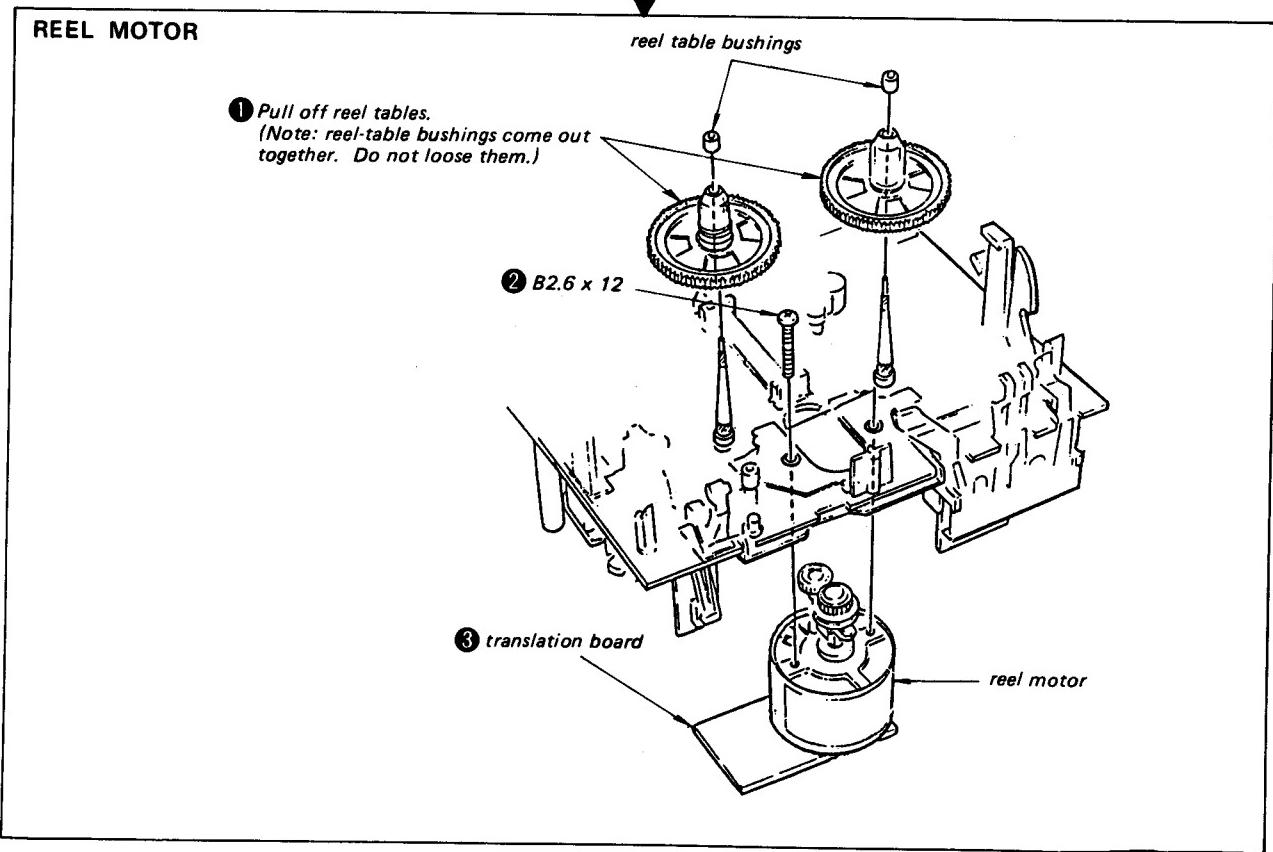
AUDIO BOARD



FRONT PANEL





**MEMO**

SECTION 3 ADJUSTMENTS

**FH-150R
TC-177R**

**FH-150R
TC-177R**

3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:
record/playback/erase head rubber belts
capstan
pinch roller
2. Demagnetize the head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

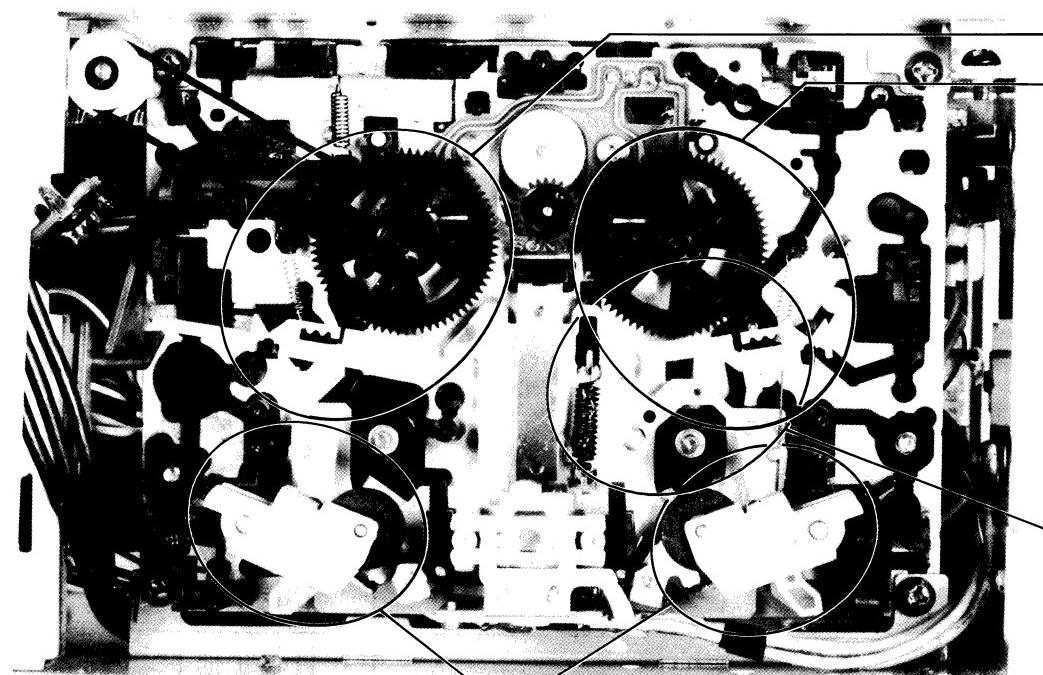
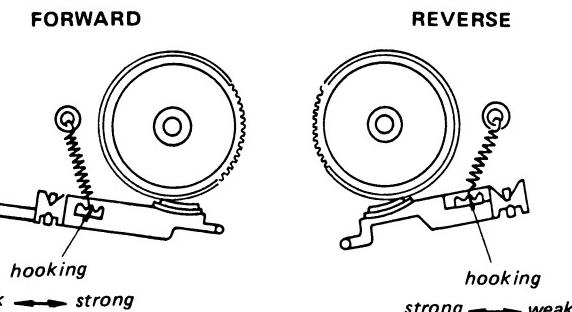
Torque	Torque meter	Meter reading
Forward	CQ-102C	28 – 60 g·cm (0.39 – 0.82 oz·inch)
Reverse	CQ-102RB	
Fast Forward and Rewind	CQ-201B	80 – 150 g·cm (1.1 – 2.07 oz·inch)
Forward Back Tension	CQ-102C	2.5 – 5.5 g·cm (0.03 – 0.07 oz·inch)
Reverse Back Tension	CQ-102RB	2.5 – 7 g·cm (0.03 – 0.09 oz·inch)

BACK TENSION ADJUSTMENT

— Forward and Reverse Playback Modes —

Forward: Torque Meter CQ-102C, Torque 2.5 – 5.5 g·cm
(0.03 – 0.07 oz·inch)

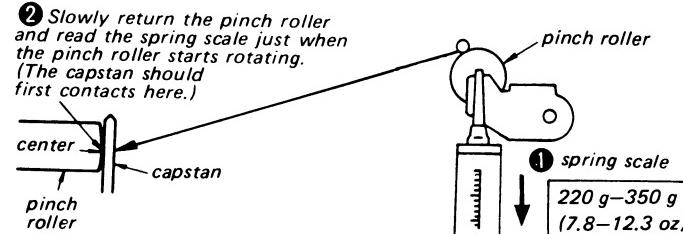
Reverse : Torque Meter CQ-102RB, Torque 2.5 – 7 g·cm
(0.03 – 0.09 oz·inch)



Pinch Roller Pressure Measurement

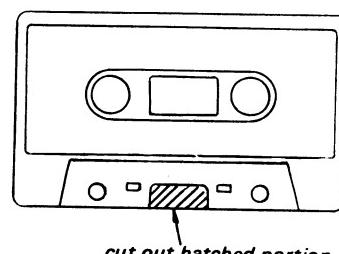
— Playback Mode —

② Slowly return the pinch roller and read the spring scale just when the pinch roller starts rotating.
(The capstan should first contacts here.)

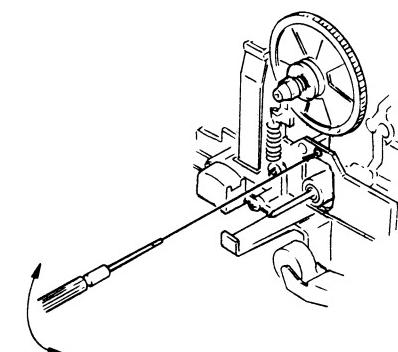


Head Position Adjustment in AMS mode

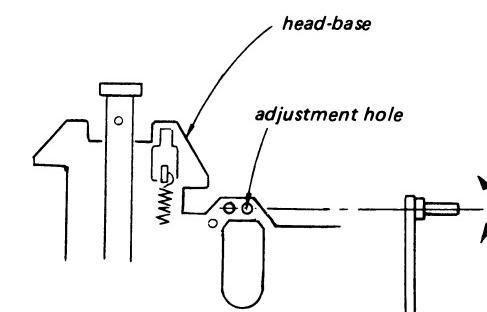
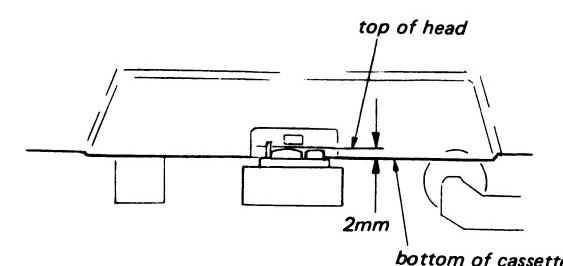
1. Prepare an adjustment cassette as shown below.



If it is not, insert a small screwdriver to the adjustment hole and adjust the head position by bending a head-base so that the distance between top of head and bottom of cassette is 2 mm±0.1 mm.



2. In AMS mode, confirm that the the distance between top of head and bottom of cassette is 2 mm ±0.1 mm (3/32 inch).



Precaution on Replacing

As the head center adjustment and the tape path adjustment are affected each other, do not perform them at the same time.

Note: When the record/playback/erase head is replaced, be sure to perform the preliminary adjustment first.

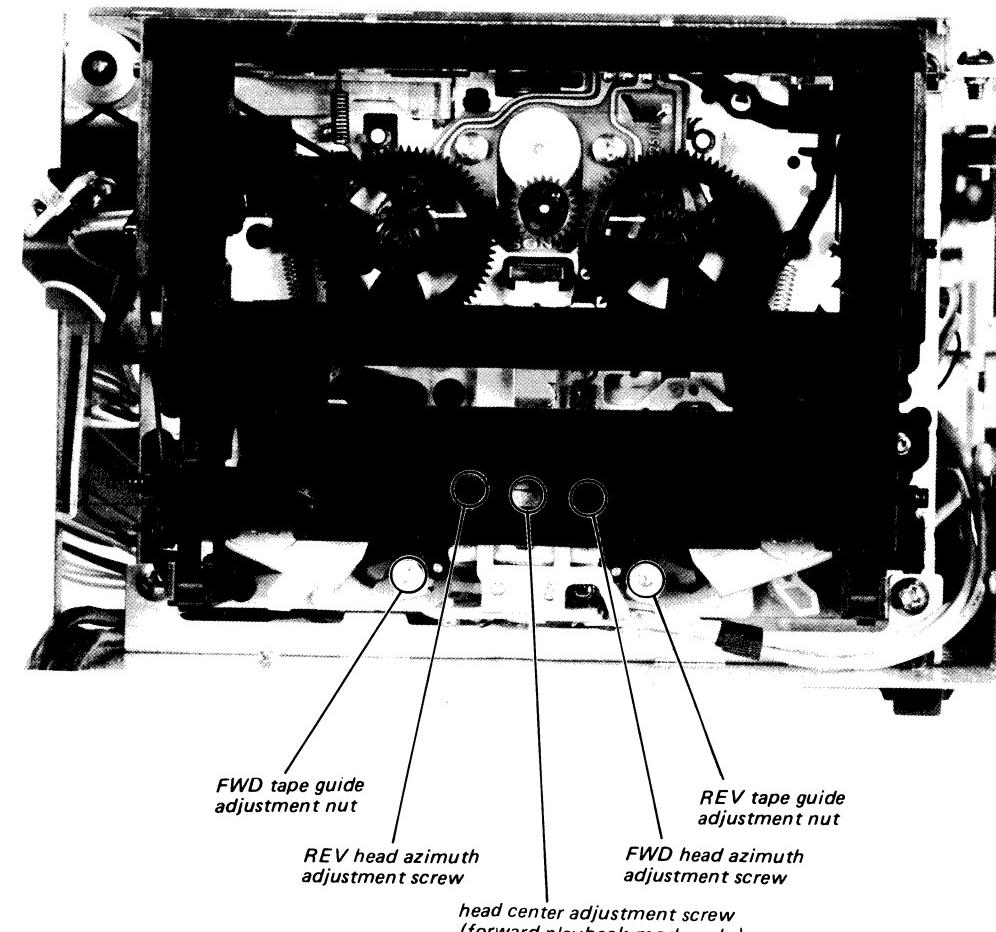
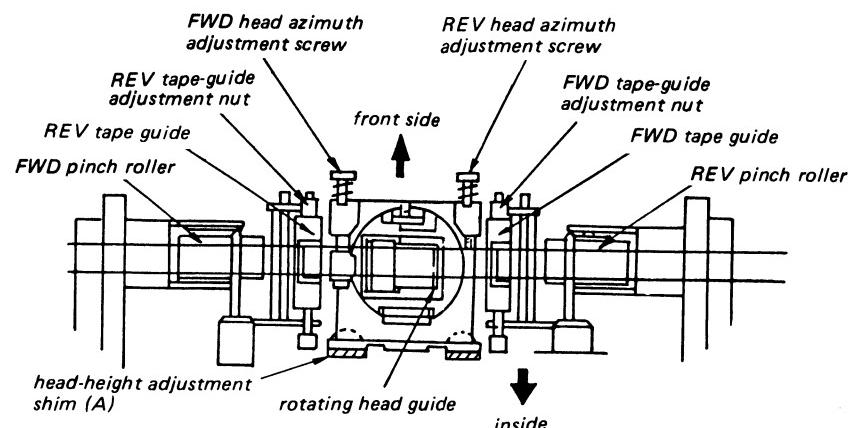
Head Center Adjustment

1. Insert a mirror tape cassette, CQ-009C or CQ-012C.
2. Place the unit in forward playback mode.
3. When the lower part of the tape is warped, loosen the head center adjustment screw. (Loosen the screw within one turn.)
4. Place the unit in reverse-playback mode.
5. When the upper part of the tape is warped, secure the adjustment screw. (Secure the screw within one turn.)
6. Repeat steps 2 to 5 several times until there is no warp both in forward and reverse mode.
7. If the warp is not disappeared, repeat steps 2 to 6 after adding or removing the head height adjustment shim (A).
8. After adjustment, lock the head center adjustment screw with locking compound.

Tape Path Adjustment

1. Clean the pinch roller and the record/playback/erase head with soft cloth moistened with alcohol.
2. Mode: playback
Refer to step 1 of the Record/playback Head Azimuth Adjustment on page TC-16 for the setup.
3. Adjust the FWD azimuth adjustment screw in the forward-playback mode and the REV azimuth adjustment screw in the reverse-playback mode so that the oscilloscope reads the maximum output and lissajous figure is in 30 angle reading on the oscilloscope across the LINE OUT.
4. Adjust the FWD tape-guide nut in the foward-playback mode and the REV tape-guide nut in the reverse-playback mode for an in-phase lissajous pattern.
The turning amount of the nuts should be within 3/4 turns.
5. Repeat steps 3 and 4 severral times until no improvement is obtained.
6. Play a mirror tape cassette in the forward-playback mode.
7. Confirm there is no tape curl at the tape guide.

Note: After these adjustments, be sure to perform the Record/playback Head Azimuth Adjustment on page TC-16.

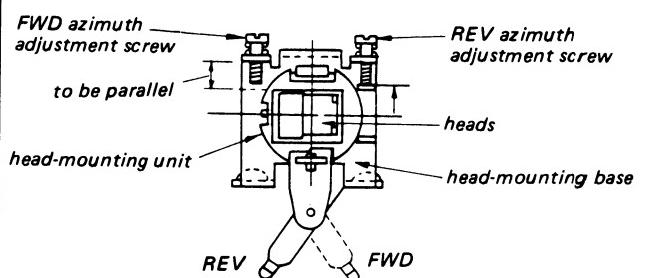


HEAD UNIT ADJUSTMENT WHEN REPLACED

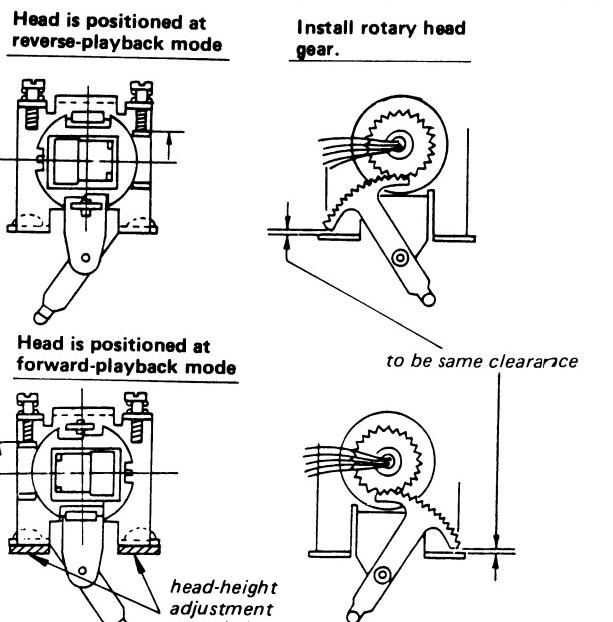
Perform the following preliminary adjustments before proceeding to the Head Center and Tape Path Adjustments.

Preliminary Adjustment

1. Install head-mounting unit on the head-mounting base by threading head lead wires through the round hole in the head-mounting base. Also refer to page TC-9.
2. By adjusting both head-azimuth adjustment screws in both forward-playback and reverse-playback mode head positions, align the head-compartment edge line in parallel with the edge line of the head-mounting unit at the azimuth adjustment screws. (visual adjustment)



Be sure to orient the rotary-head gear as shown below.



3. Reassemble the head assembly, head translation board, head-height adjustment shims (A), etc., in the reverse manner of disassembly on page TC-9.
4. Perform the Head-Center and Tape-Path Adjustments on pages TC-13 and TC-14.
5. Perform the Head-Azimuth Adjustment on page TC-16.

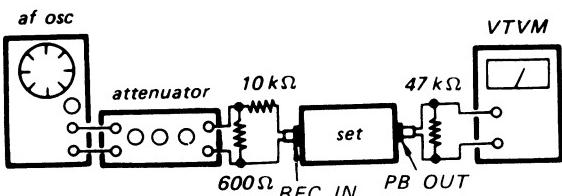
3-2. ELECTRICAL ADJUSTMENTS

Note: The adjustment should be performed in the order given in this service manual.
The adjustments should be performed for both L-CH and R-CH.

- Switches and controls should be set as follows unless otherwise specified.

DOLBY NR switch: OFF
TIMER switch: OFF
ISS switch: 2

- Standard Record:**
Deliver the standard input signal level to the input jack and control the attenuator to obtain the standard output signal level.

Record Mode —**Standard Input Level**

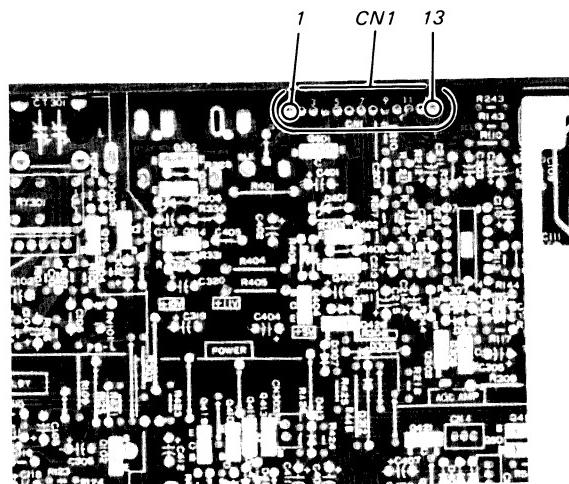
	REC IN
source impedance	10 kΩ
input level	0.44 V (-5 dB)

Standard Output Level

	PB OUT
load impedance	47 kΩ
output level	0.44 V (-5 dB)

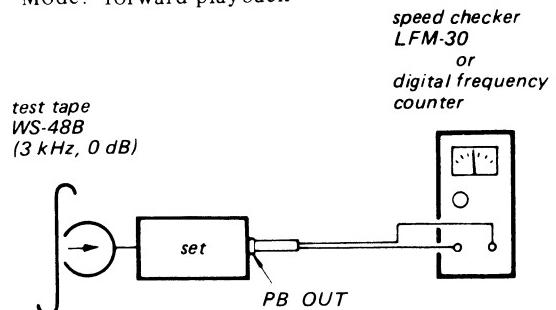
Locations of REC IN and PB OUT

	CN1 terminal No.		
	L-CH	R-CH	GND
REC IN	10	9	12
PB OUT	11	13	12

**Tape Speed Adjustment****Procedure:**

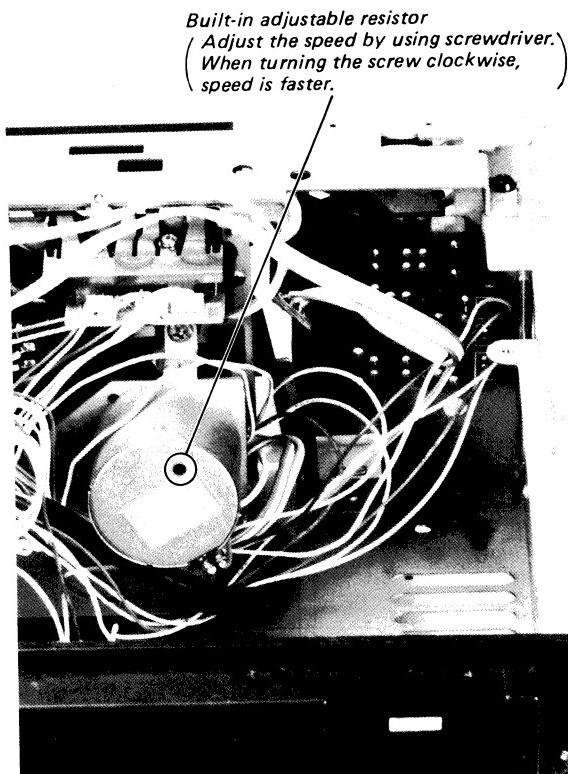
See the left for locations of REC IN and PB OUT.

Mode: forward-playback

**Specification:**

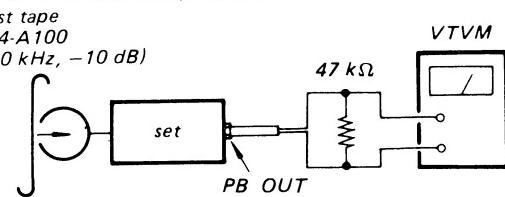
Speed checker	Digital frequency counter
-1 ~ +1 %	2,970 Hz to 3,030 Hz

Frequency difference between the beginning and the end of the tape should be within 0.8% (25Hz).

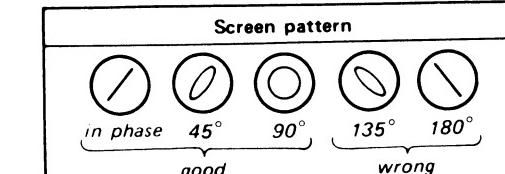
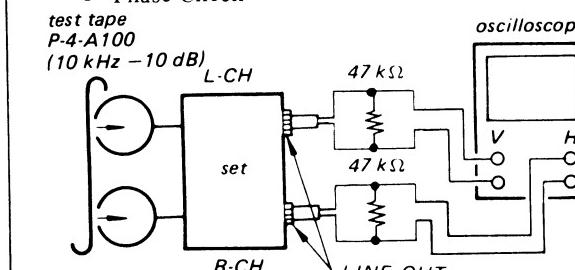
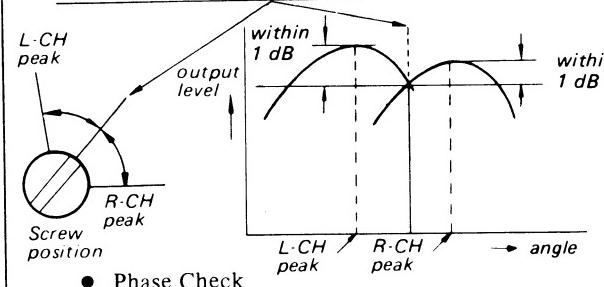
Adjustment Location: Motor (M802)**Record/playback Head Azimuth Adjustment****Procedure:**

See page TC-15 for locations of REC IN and PB OUT.

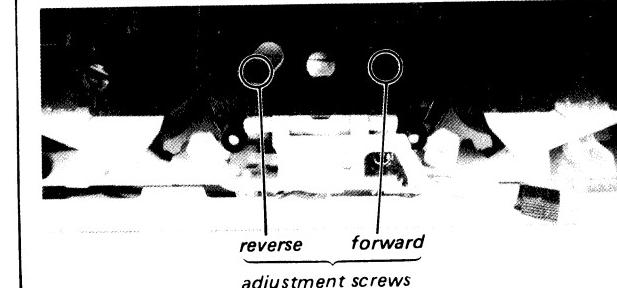
- Mode: forward-playback



- Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screws until both of output levels match together within 1 dB.

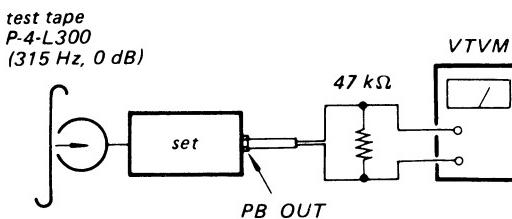


- Set in the reverse-playback mode and repeat the steps 1 ~ 2.
- After the adjustment, lock the screws with locking compound.

Adjustment Location:**Playback Level Adjustment****Procedure:**

See page TC-15 for locations of REC IN and PB OUT.

Mode: playback



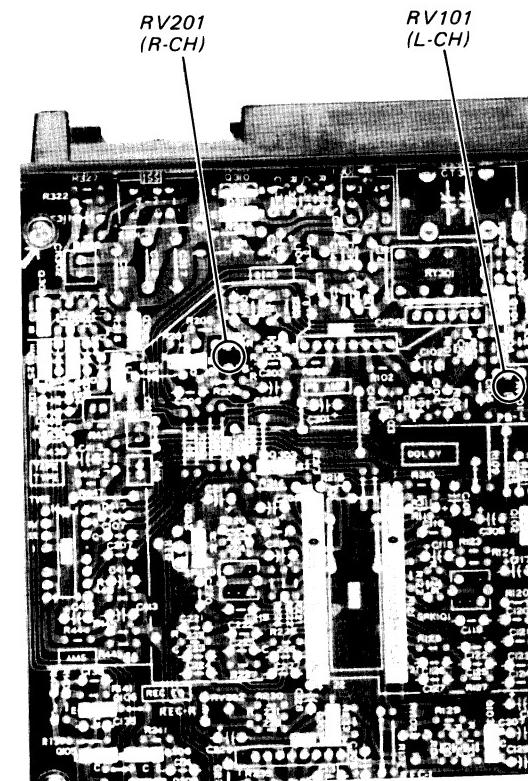
Adjust the RV101 (L-CH) and RV201 (R-CH) so that the specification is met.

Specification:

PB OUT level: 0.41 to 0.46 V
(-5.5 to -4.5 dB)

Level difference between channels:
less than 0.5 dB

Check that the PB OUT level does not change in playback mode while changing the mode from playback to stop several times.

Adjustment Location: audio board

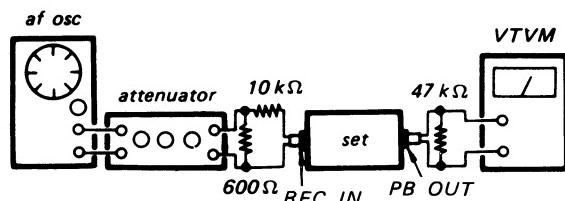
3-2. ELECTRICAL ADJUSTMENTS

Note: The adjustment should be performed in the order given in this service manual.
The adjustments should be performed for both L-CH and R-CH.

- Switches and controls should be set as follows unless otherwise specified.

DOLBY NR switch: OFF
TIMER switch: OFF
ISS switch: 2

- Standard Record:**
Deliver the standard input signal level to the input jack and control the attenuator to obtain the standard output signal level.

— Record Mode —**Standard Input Level**

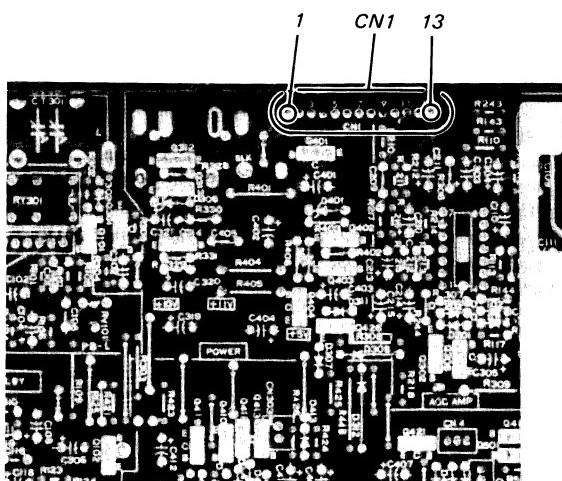
	REC IN
source impedance	10 kΩ
input level	0.44 V (-5 dB)

Standard Output Level

	PB OUT
load impedance	47 kΩ
output level	0.44 V (-5 dB)

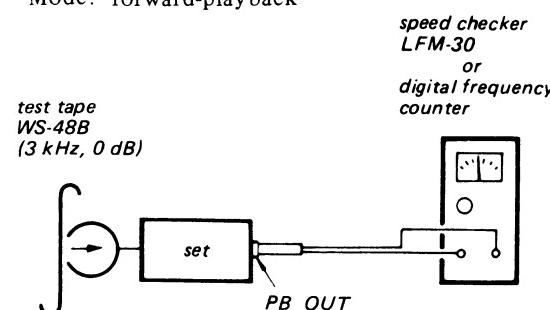
Locations of REC IN and PB OUT

	CN1 terminal No.		
	L-CH	R-CH	GND
REC IN	10	9	12
PB OUT	11	13	12

**Tape Speed Adjustment****Procedure:**

See the left for locations of REC IN and PB OUT.

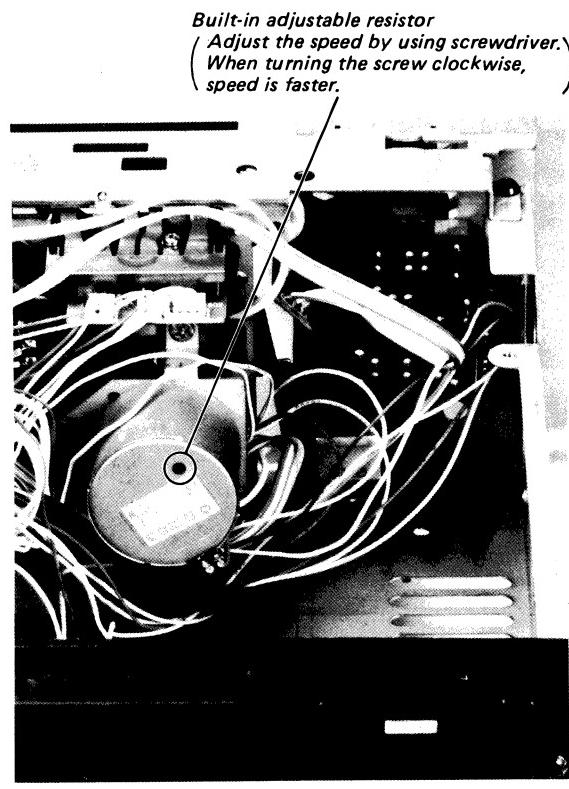
Mode: forward-playback

**Specification:**

Speed checker	Digital frequency counter
-1 ~ +1 %	2,970 Hz to 3,030 Hz

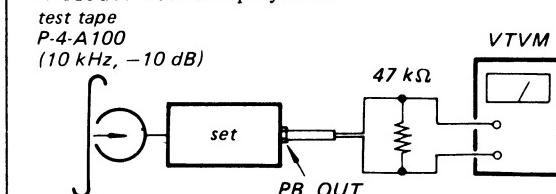
Frequency difference between the beginning and the end of the tape should be within 0.8% (25Hz).

Adjustment Location: Motor (M802)

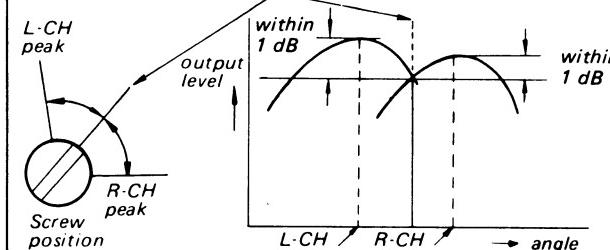
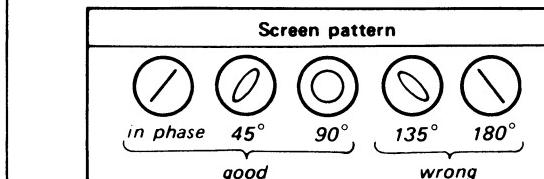
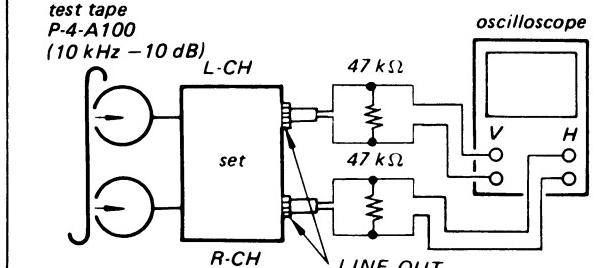
**Record/playback Head Azimuth Adjustment****Procedure:**

See page TC-15 for locations of REC IN and PB OUT.

- Mode: forward-playback



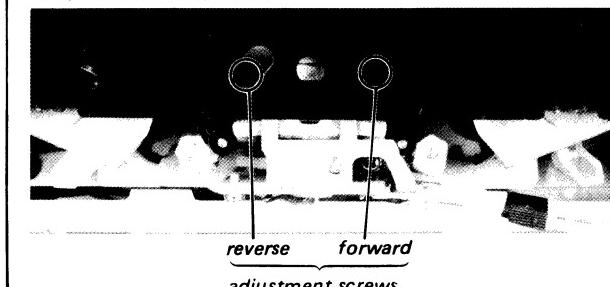
- Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screws until both of output levels match together within 1 dB.

**Phase Check**

- Set in the reverse-playback mode and repeat the steps 1 ~ 2.

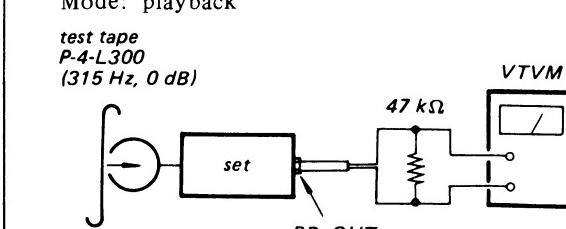
- After the adjustment, lock the screws with locking compound.

Adjustment Location:

**Playback Level Adjustment****Procedure:**

See page TC-15 for locations of REC IN and PB OUT.

Mode: playback



Adjust the RV101 (L-CH) and RV201 (R-CH) so that the specification is met.

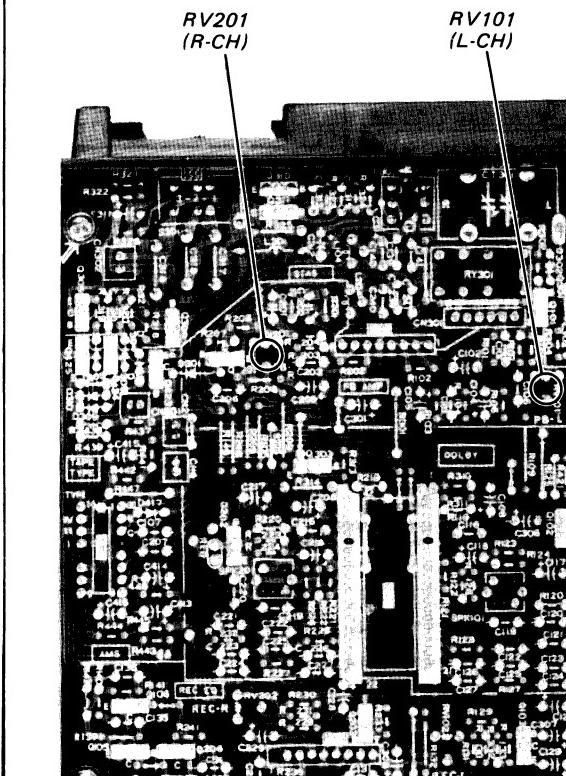
Specification:

PB OUT level: 0.41 to 0.46 V
(-5.5 to -4.5 dB)

Level difference between channels:
less than 0.5 dB

Check that the PB OUT level does not change in playback mode while changing the mode from playback to stop several times.

Adjustment Location: audio board



Note: Before performing Record Bias/Record Level Adjustment, connect pattern.

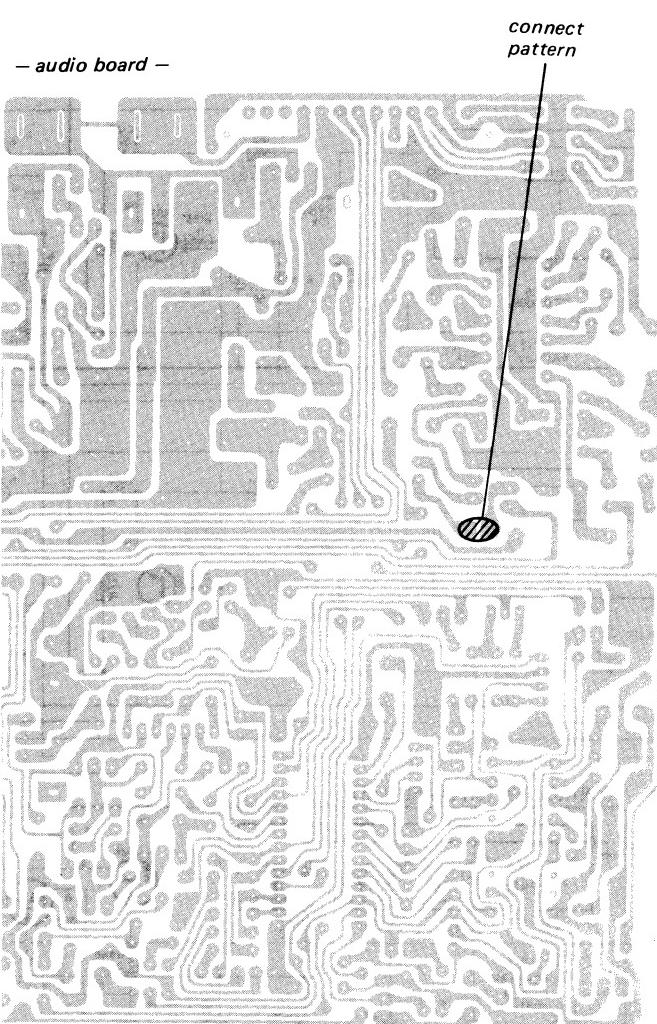


Fig. 1 Connecting Portion at the Adjustment

Record Bias Adjustment

Setting:

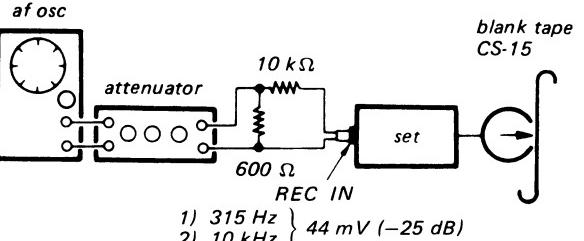
ATTENUATOR: standard record
(See page TC-15.)

Connect pattern as shown in Fig. 1.

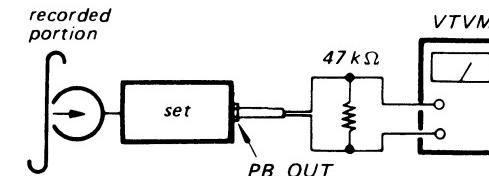
Procedure:

See page TC-15 for locations of REC IN and PB OUT.

1. Mode: record



2. Mode: playback

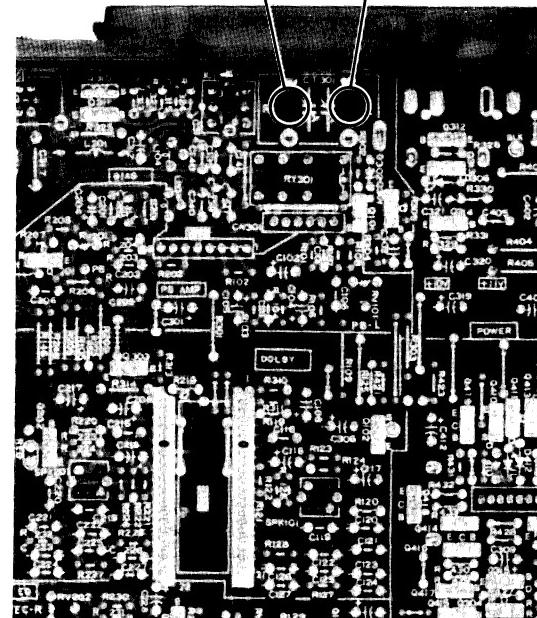


Confirm that the 10 kHz playback output is 0 dB relative to the 315 Hz output. If necessary, adjust CT301-1 (L-CH), CT301-2 (R-CH) and repeat the steps given above.

3. After the adjustment, disconnect pattern.

Adjustment Location: audio board

CT301-2 (R-CH) CT301-1 (L-CH)



Record Level Adjustment

Setting:

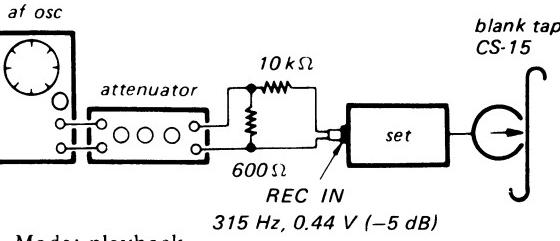
ATTENUATOR: standard record
(See page TC-15.)

Connect pattern as shown in Fig. 1.

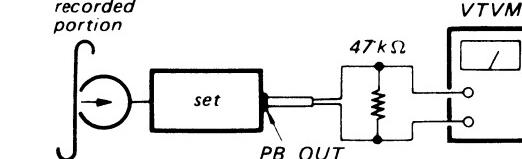
Procedure:

See page TC-15 for locations of REC IN and PB OUT.

1. Mode: record



2. Mode: playback



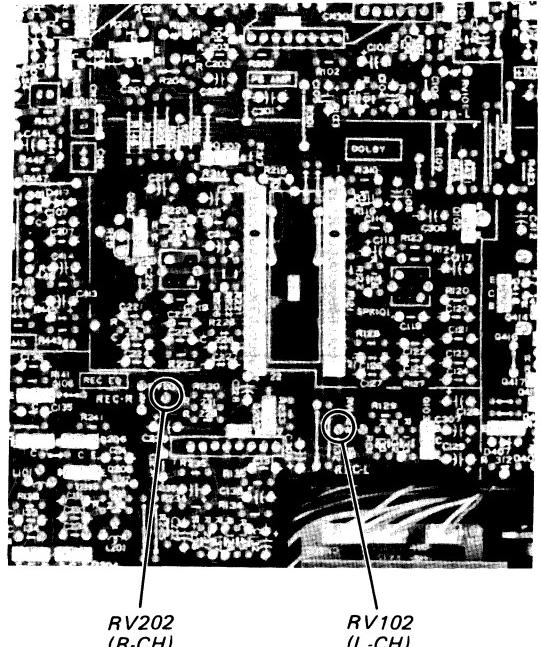
3. Play back the signal recorded in step 1.

Confirm that the signal level is within the specification below. If necessary, adjust RV102 (L-CH), RV202 (R-CH) and repeat the steps 1 - 3.

Specification:

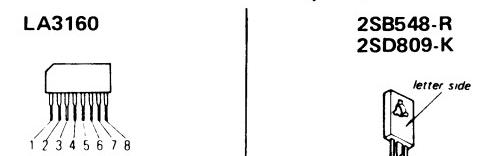
PB OUT level: 0.41 to 0.46 V
(-5.5 to -4.5 dB)

4. After the adjustment, disconnect pattern.



● Semiconductor Lead Layouts

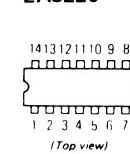
LA3160



2SB548-R
2SD809-K

letter side

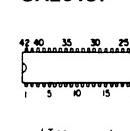
LA3220



2SB1013
2SD1387

cathode

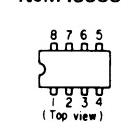
CX20187



2SC2603-F
DTA114ES
DTA144ES
DTC144ES

anode

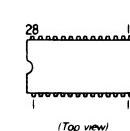
NJM4558S



GL-1EG102
GL-1HY102
GL-1PR102

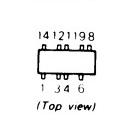
cathode

TC9312N-001



anode

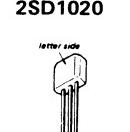
CX10034



GL-8PG1

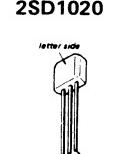
cathode

2SA1175



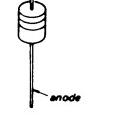
2SD1020

anode

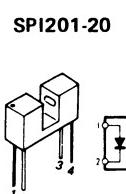
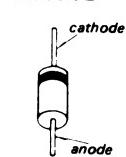


1SS202-1

cathode



HZ11A1L
HZ11B2L
HZ26B1L



Note: Before performing Record Bias/Record Level Adjustment, connect pattern.

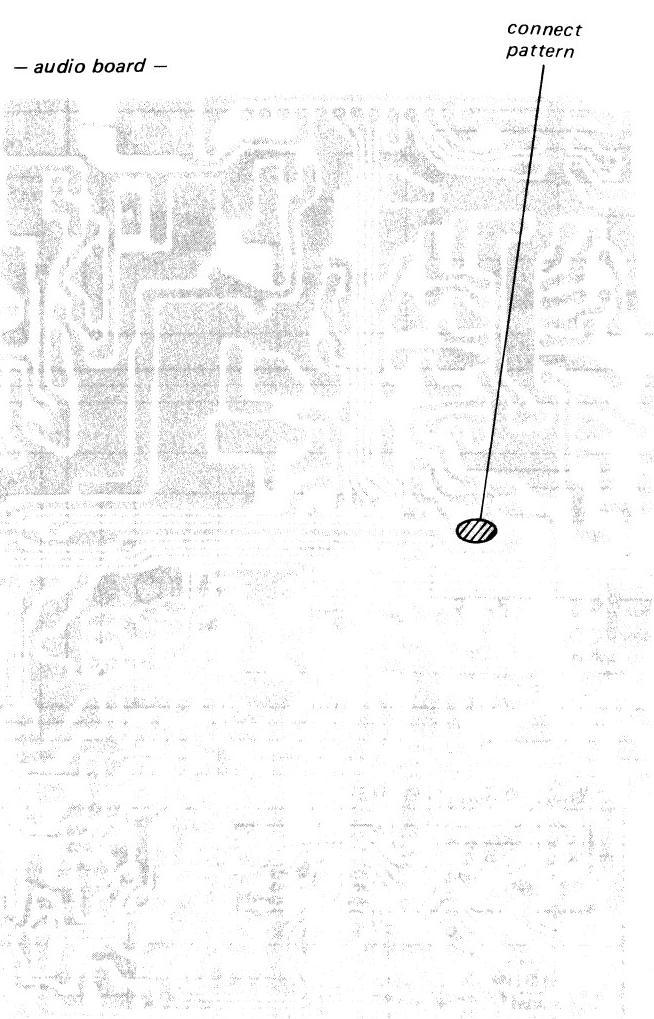


Fig. 1 Connecting Portion at the Adjustment

Record Bias Adjustment

Setting:

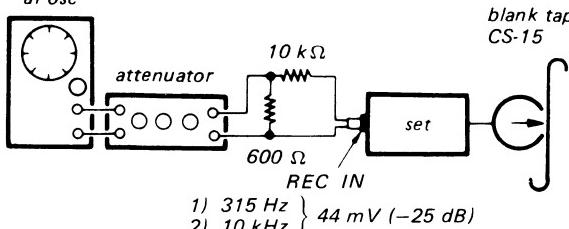
ATTENUATOR: standard record
(See page TC-15.)

Connect pattern as shown in Fig. 1.

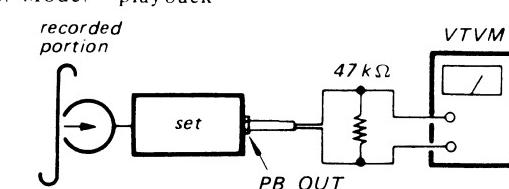
Procedure:

See page TC-15 for locations of REC IN and PB OUT.

1. Mode: record af osc



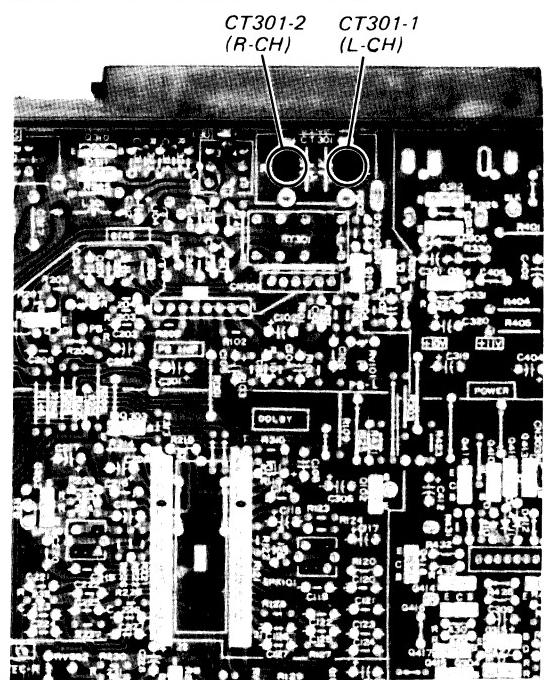
2. Mode: playback



Confirm that the 10 kHz playback output is 0 dB relative to the 315 Hz output. If necessary, adjust CT301-1 (L-CH), CT301-2 (R-CH) and repeat the steps given above.

3. After the adjustment, disconnect pattern.

Adjustment Location: audio board



Record Level Adjustment

Setting:

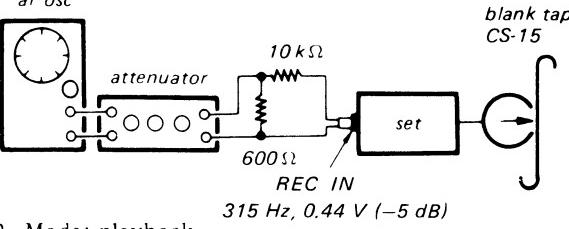
ATTENUATOR: standard record
(See page TC-15.)

Connect pattern as shown in Fig. 1.

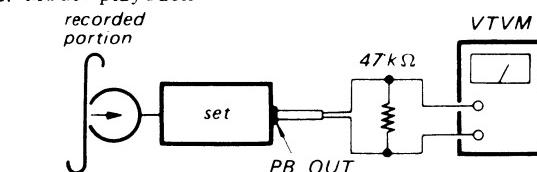
Procedure:

See page TC-15 for locations of REC IN and PB OUT.

1. Mode: record af osc



2. Mode: playback



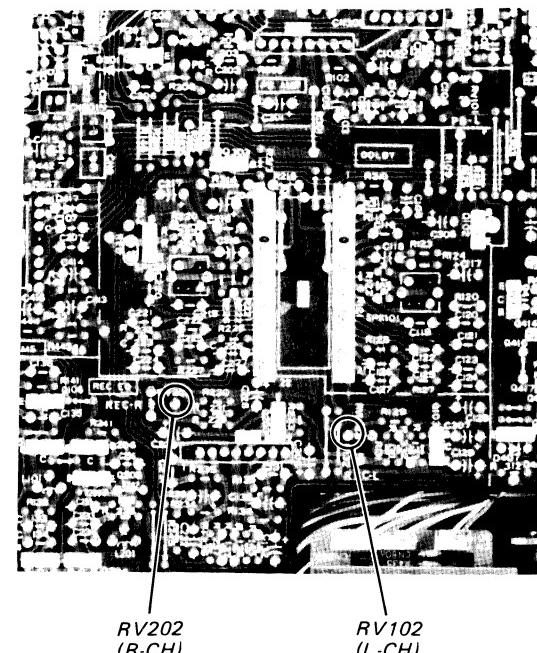
3. Play back the signal recorded in step 1.

Confirm that the signal level is within the specification below. If necessary, adjust RV102 (L-CH), RV202 (R-CH) and repeat the steps 1 – 3.

Specification:

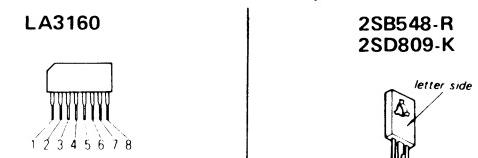
PB OUT level: 0.41 to 0.46 V
(-5.5 to -4.5 dB)

4. After the adjustment, disconnect pattern.

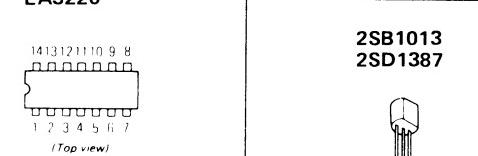


● Semiconductor Lead Layouts

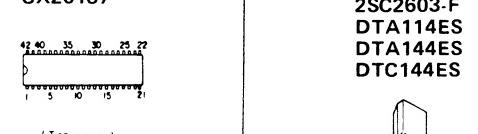
LA3160



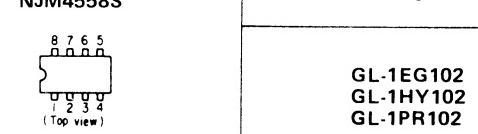
LA3220



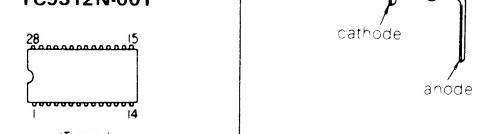
CX20187



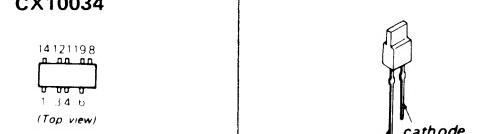
NJM4558S



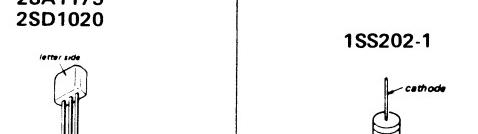
TC9312N-001



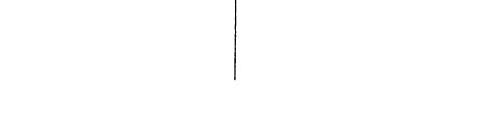
CX10034



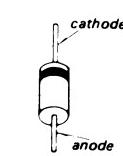
2SA1175



1SS202-1

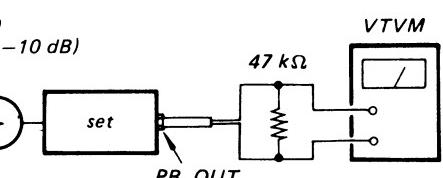


HZ11A1L
HZ11B2L
HZ6B1L

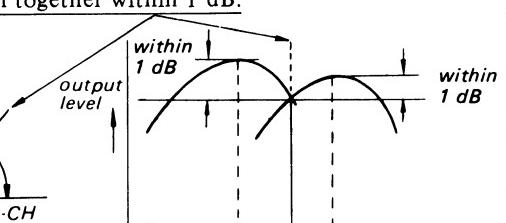


d/playback Head Azimuth Adjustment

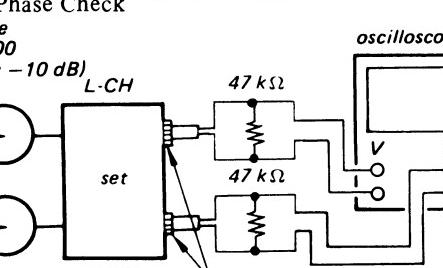
Procedure:
See page TC-15 for locations of REC IN and PB OUT.
Mode: forward-playback
Type:
100 Hz, -10 dB



Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screws until both of output levels match together within 1 dB.

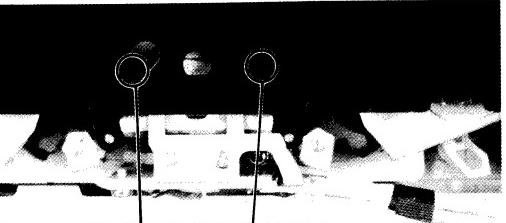


Phase Check
tape A100
100 Hz -10 dB



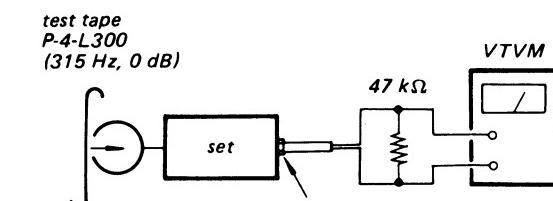
Screen pattern
in phase 45° 90° 135° 180°
good wrong

Set in the reverse-playback mode and repeat the steps 1 - 2.
After the adjustment, lock the screws with locking compound.

Adjustment Location:


Playback Level Adjustment

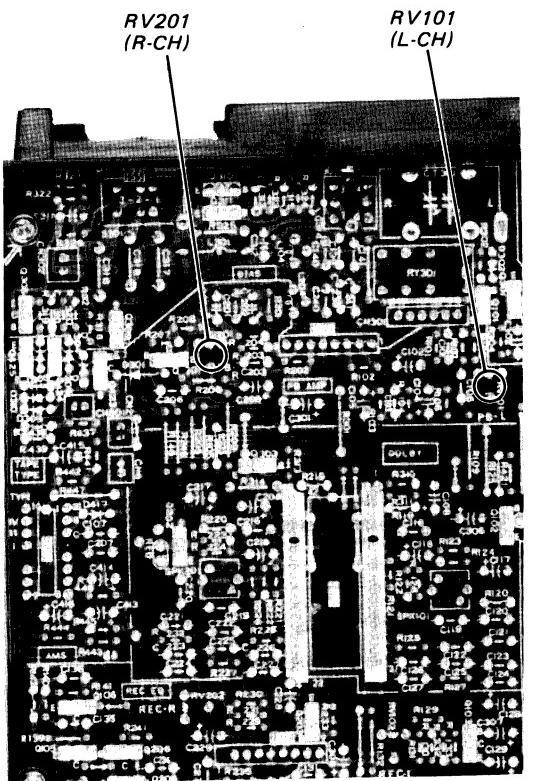
Procedure:
See page TC-15 for locations of REC IN and PB OUT.
Mode: playback
test tape P-4-L300 (315 Hz, 0 dB)



Adjust the RV101 (L-CH) and RV201 (R-CH) so that the specification is met.

Specification:
PB OUT level: 0.41 to 0.46 V (-5.5 to -4.5 dB)
Level difference between channels: less than 0.5 dB
Check that the PB OUT level does not change in playback mode while changing the mode from playback to stop several times.

Adjustment Location: audio board



Note: Before performing Record Bias/Record Level Adjustment, connect pattern.

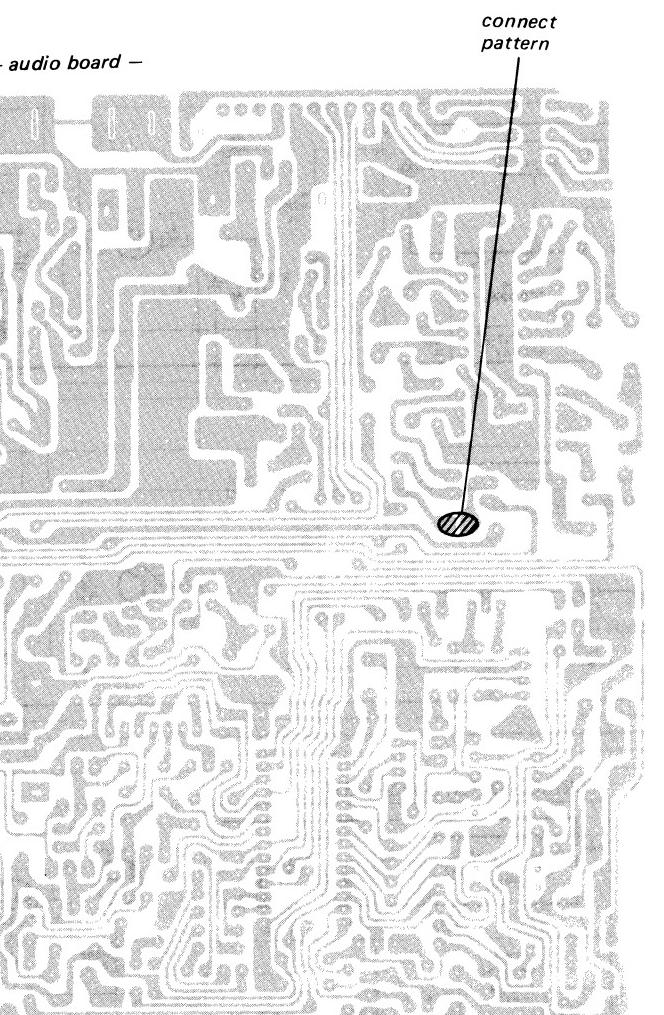


Fig. 1 Connecting Portion at the Adjustment

Record Bias Adjustment

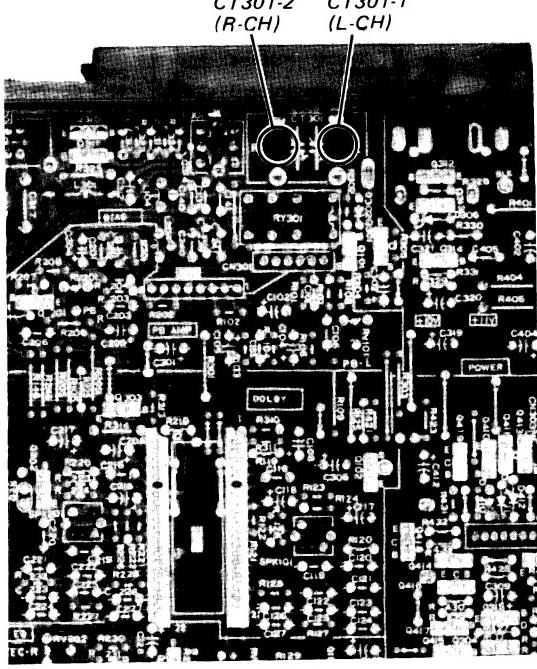
Setting:
ATTENUATOR: standard record (See page TC-15.)

Connect pattern as shown in Fig. 1.

Procedure:
See page TC-15 for locations of REC IN and PB OUT.

- 1. Mode: record**
af osc → attenuator → 10 kΩ → 600 Ω → REC IN
1) 315 Hz } 44 mV (-25 dB)
2) 10 kHz }
- 2. Mode: playback**
recorded portion → set → 47 kΩ → VTVM → PB OUT
Confirm that the 10 kHz playback output is 0 dB relative to the 315 Hz output. If necessary, adjust CT301-1 (L-CH), CT301-2 (R-CH) and repeat the steps given above.
- 3. After the adjustment, disconnect pattern.**

Adjustment Location: audio board



Record Level Adjustment

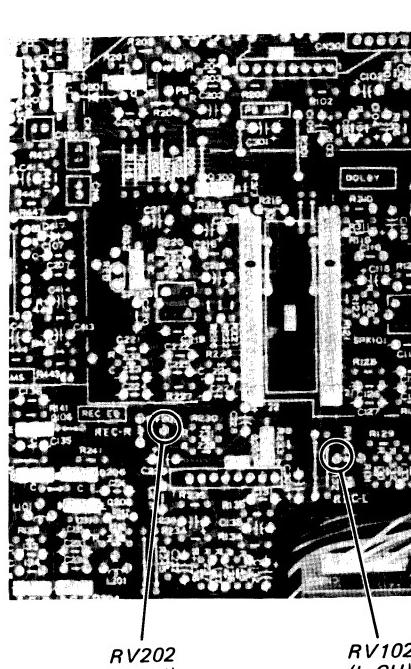
Setting:
ATTENUATOR: standard record (See page TC-15.)

Connect pattern as shown in Fig. 1.

Procedure:
See page TC-15 for locations of REC IN and PB OUT.

- 1. Mode: record**
af osc → attenuator → 10 kΩ → 600 Ω → REC IN
315 Hz, 0.44 V (-5 dB)
- 2. Mode: playback**
recorded portion → set → 47 kΩ → PB OUT
Play back the signal recorded in step 1. Confirm that the signal level is within the specification below. If necessary, adjust RV202 (R-CH) and repeat the steps 1 - 2.
- 3. Play back the signal recorded in step 1.**
Confirm that the signal level is within the specification below. If necessary, adjust RV202 (R-CH) and repeat the steps 1 - 2.
- 4. After the adjustment, disconnect pattern.**

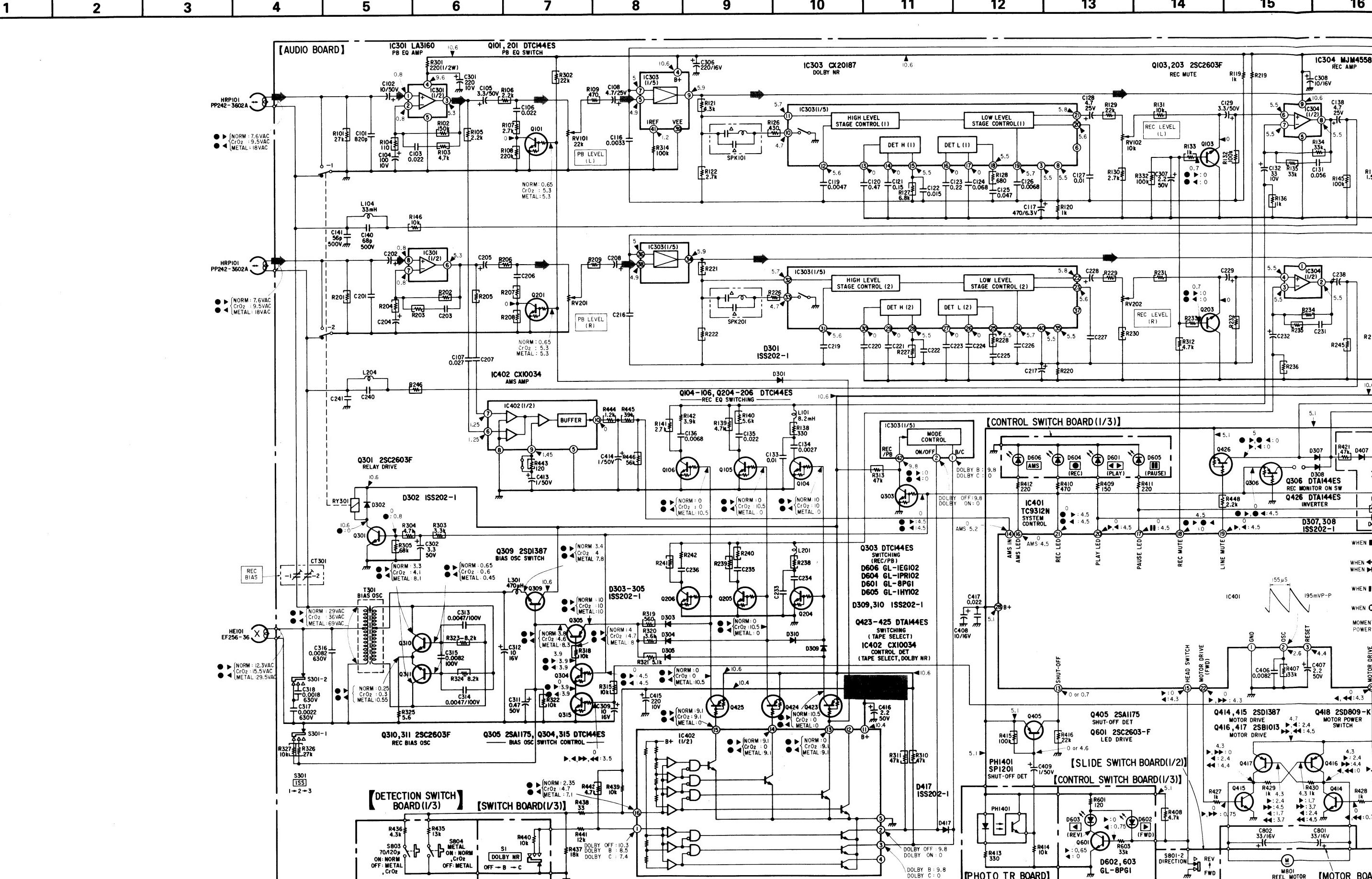
Specification:
PB OUT level: 0.41 to 0.46 V (-5.5 to -4.5 dB)

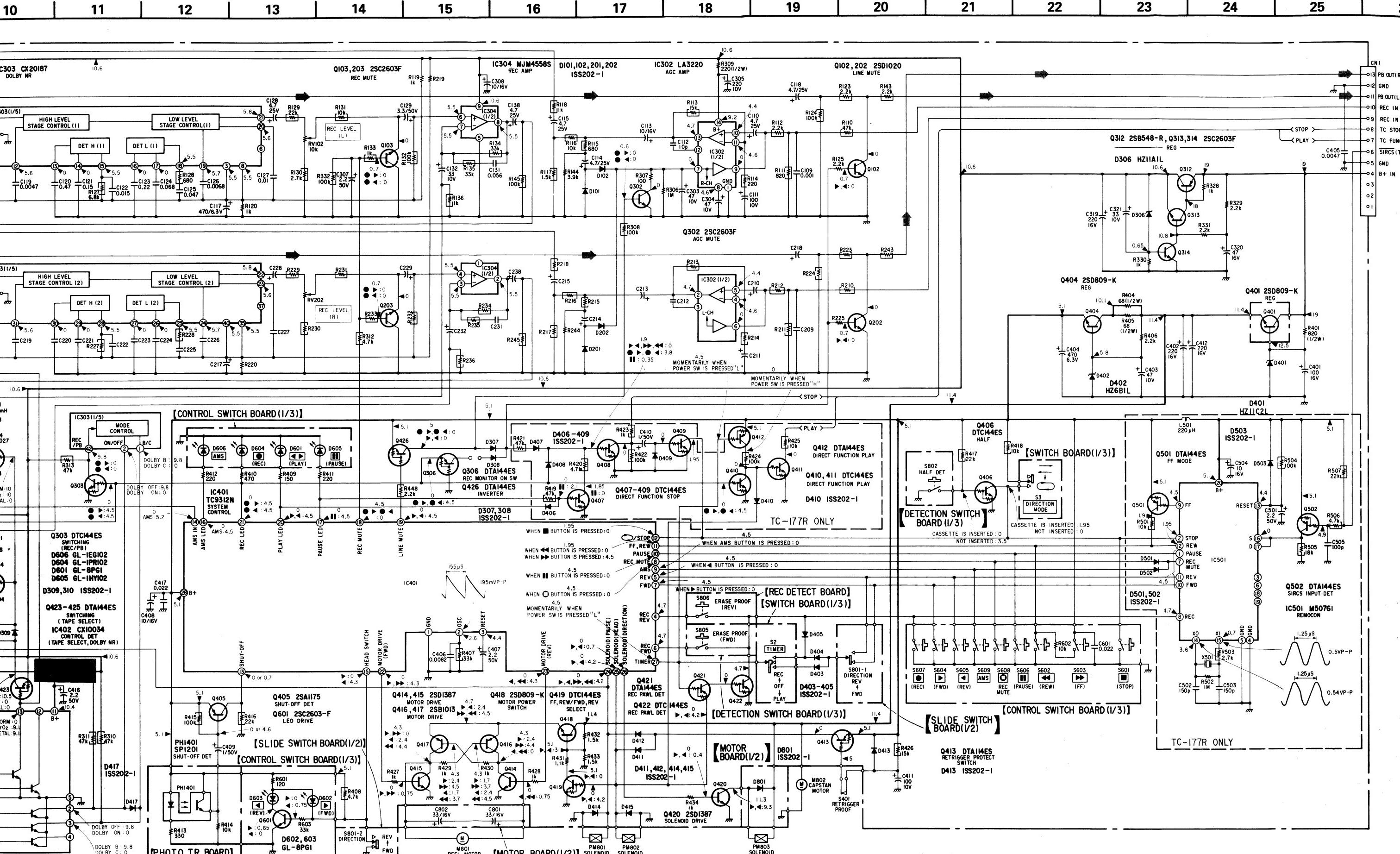


**SECTION 4
DIAGRAMS**

**FH-150R
TC-177R**

4-1. SCHEMATIC DIAGRAM

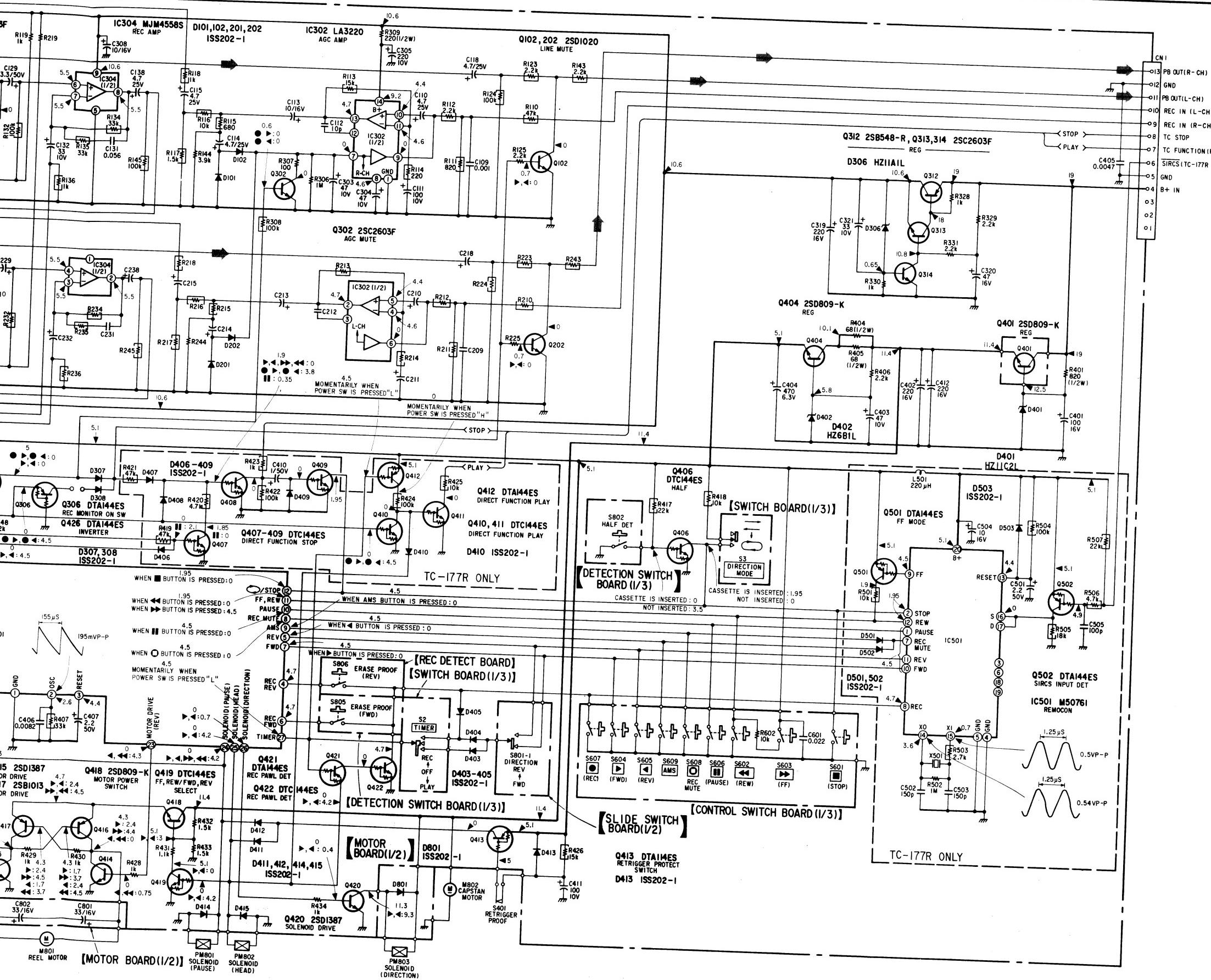




FH-150R
TC-177R

FH-150R
TC-177R

A horizontal ruler scale from 15 to 26 inches. The numbers are labeled at each integer unit. There are vertical tick marks between each number, and horizontal tick marks below the scale line.



- Note:**

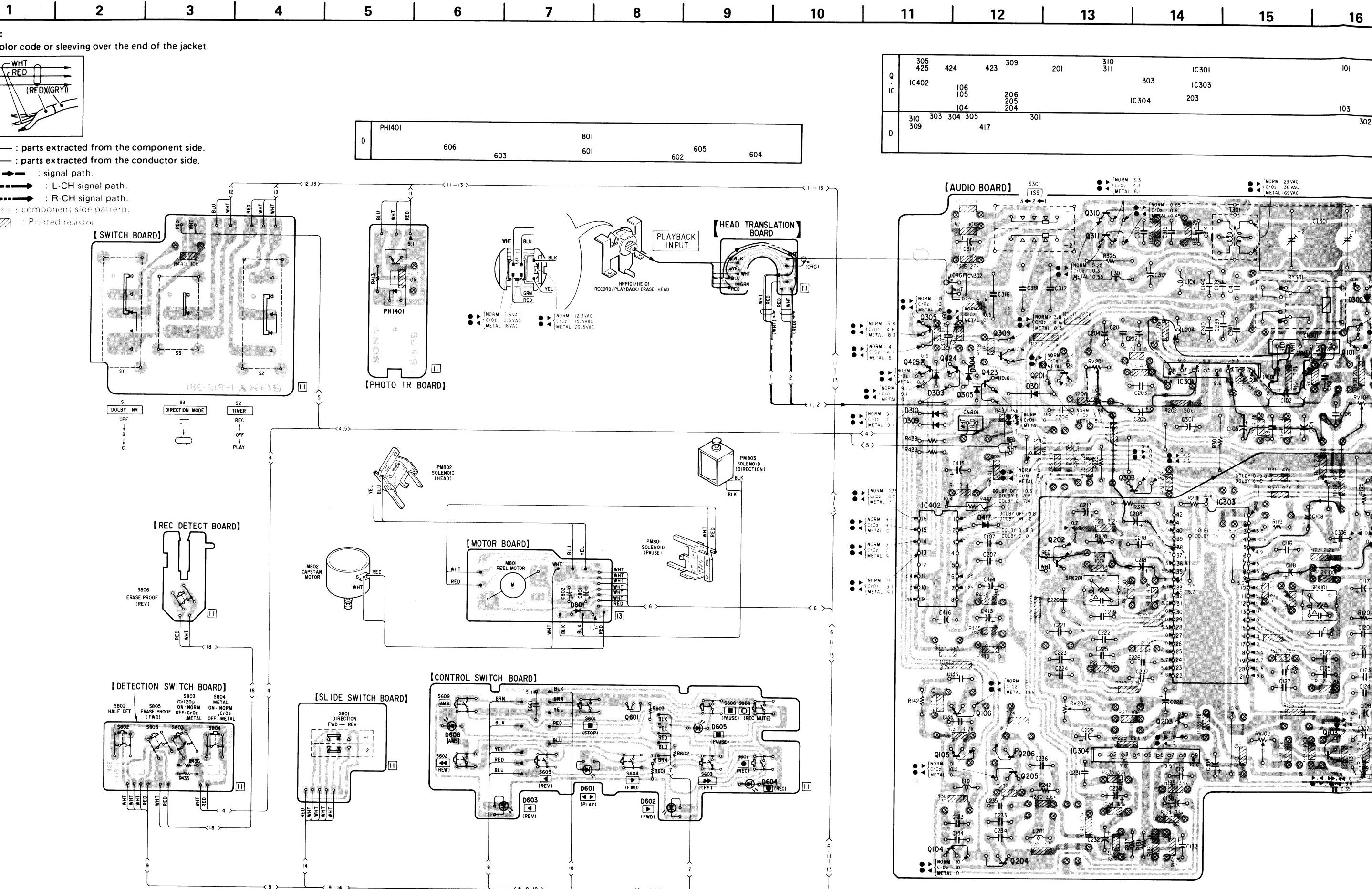
 - All capacitors are in μF unless otherwise noted. pF: $\mu\mu\text{F}$ 50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
 -  : signal path.
 - Components for right channel have same values as for left channel. Reference numbers are coded from 200.
 -  : fusible resistor.
 -  : printed resistor.
 -  : B+ bus.
 -  : adjustment for repair.
 - AC voltage readings in the bias oscillator with a VTVM.
 - Voltages are dc with respect to ground unless otherwise noted.
 - Readings are taken under no-signal conditions with a VOM (50 $\text{k}\Omega/\text{V}$).
 - Voltage variations may be noted due to normal production tolerances.
 - | | |
|------------|---------------|
| ► : FWD | ◀ : REV |
| ◀◀ : REW | ● : REC |
| ■■ : PAUSE | No mark: STOP |
 - | | |
|---------------|---------------|
| ●/◀ : REC REV | ● : REC MUTE |
| ▶▶ : FF | ●/▶ : REC FWD |
 - Waveforms are taken to ground under no-signal conditions with oscilloscope.

Voltage variations may be noted due to normal production tolerances.

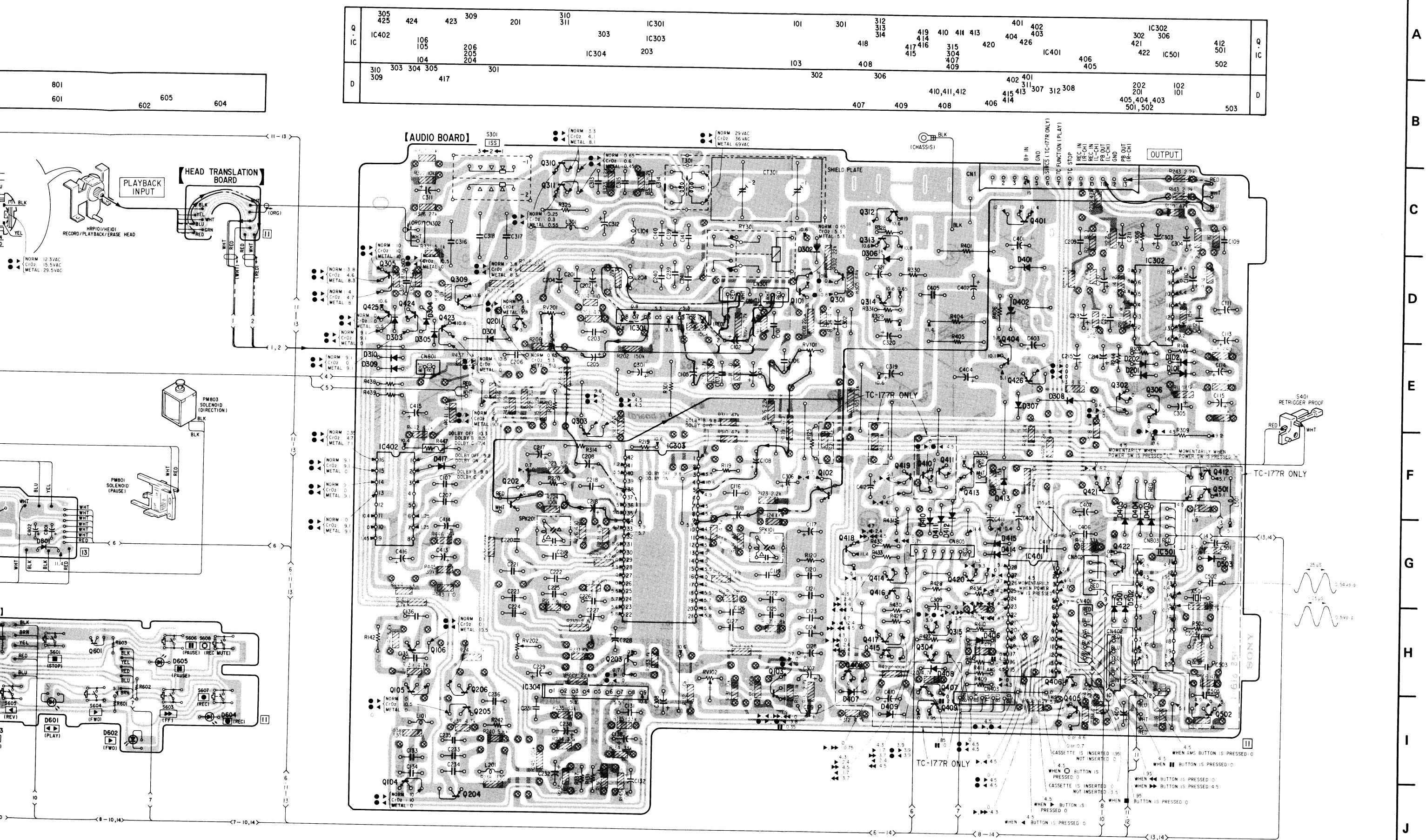
Ref. No.	Switch	Position
S1	DOLBY NR	OFF
S2	TIMER	OFF
S3	DIRECTION MODE	→
S301	ISS	1
S401	RETRIGGER PROOF	OFF
S601	■ (STOP)	OFF
S602	◀ (REW)	OFF
S603	▶ (FF)	OFF
S604	► (FWD)	OFF
S605	◀ (REV)	OFF
S606	■ (PAUSE)	OFF
S607	● (REC)	OFF
S608	○ (REC MUTE)	OFF
S609	AMS	OFF
S801	DIRECTION	FWD
S802	HALF DET	OFF
S803	70/120 μ	OFF
S804	METAL	OFF
S805	ERASE PROOF (FWD)	OFF
S806	ERASE PROOF (REV)	OFF

Note: The components identified by shading and mark
are critical for safety. Replace only with
part number specified.

4-2. MOUNTING DIAGRAM



7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 18-177K



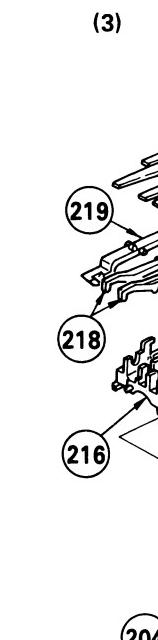
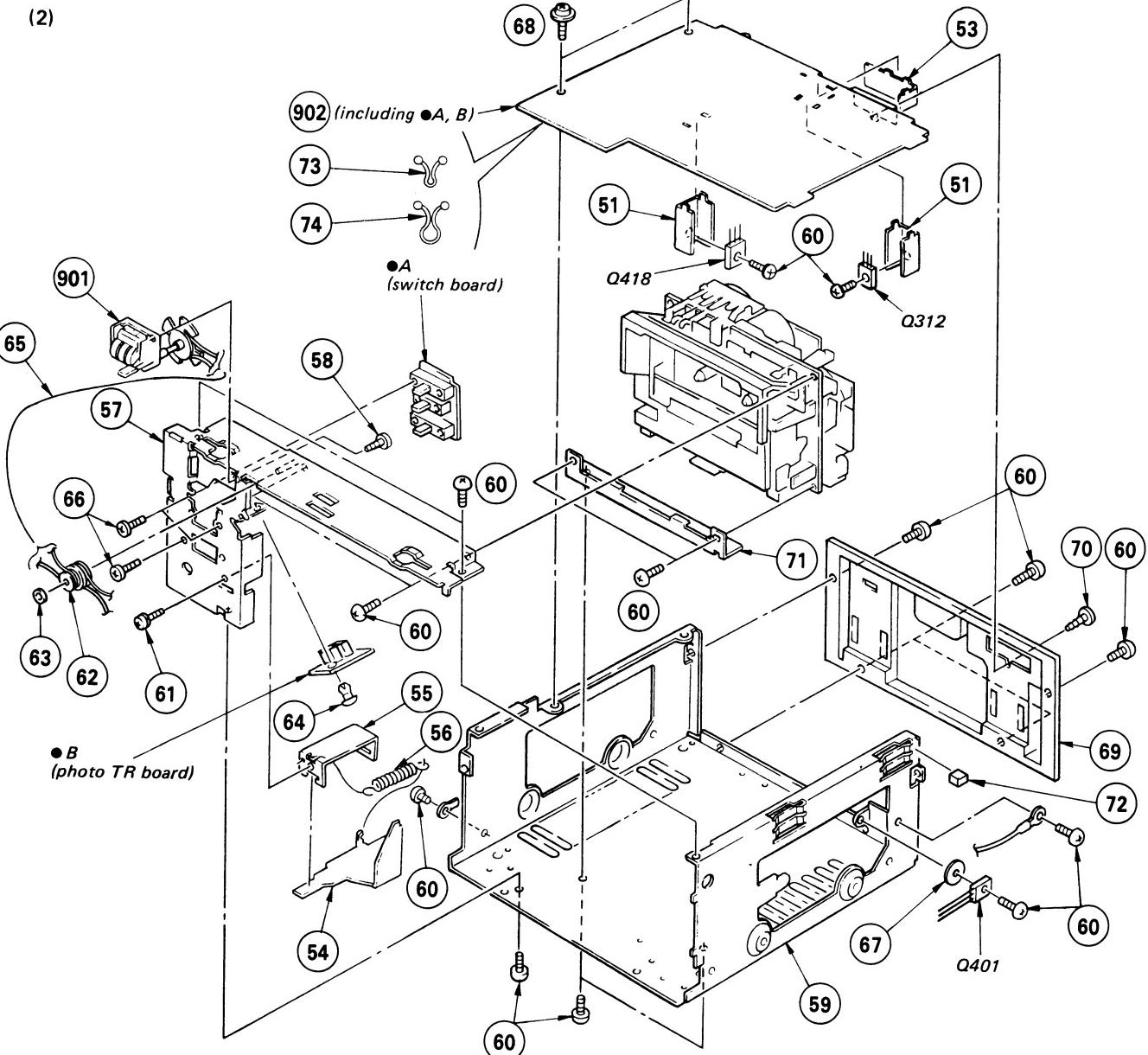
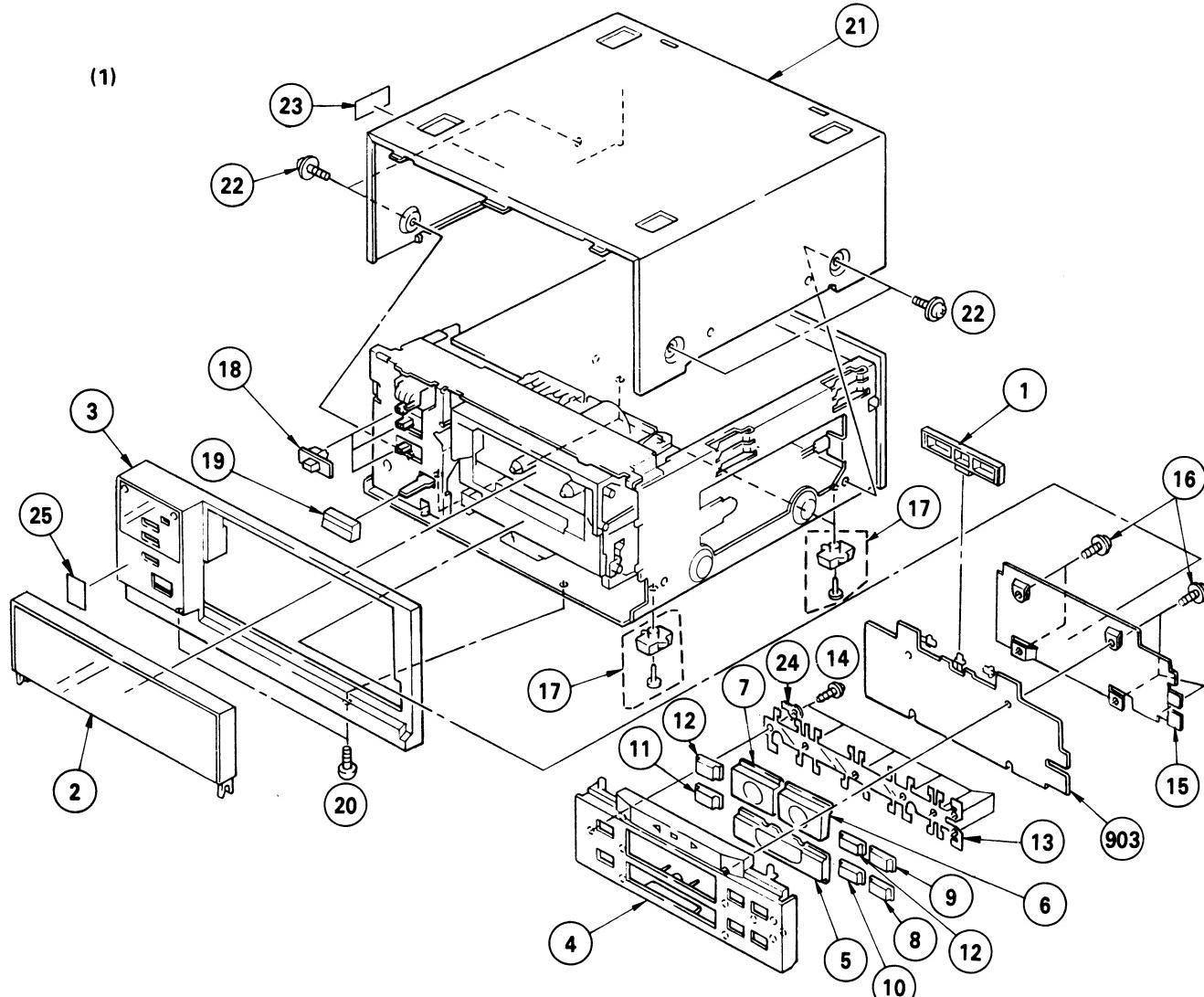
SECTION 5
EXPLODED VIEWS AND PARTS LIST

NOTE:
The mechanical parts with no reference number in the exploded views are not supplied.

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The construction parts of an assembled part are indicated with a callout number in the remark column.

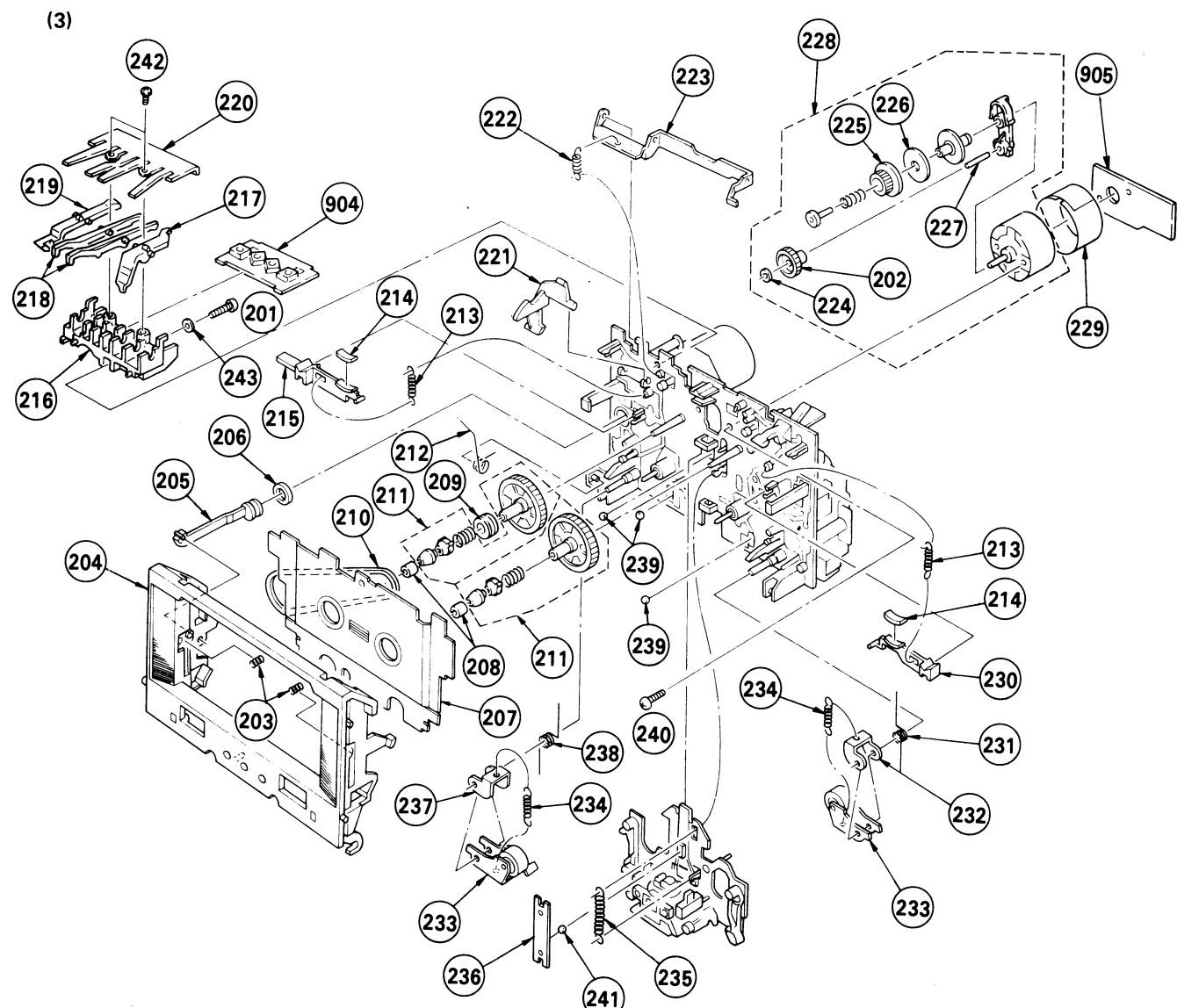
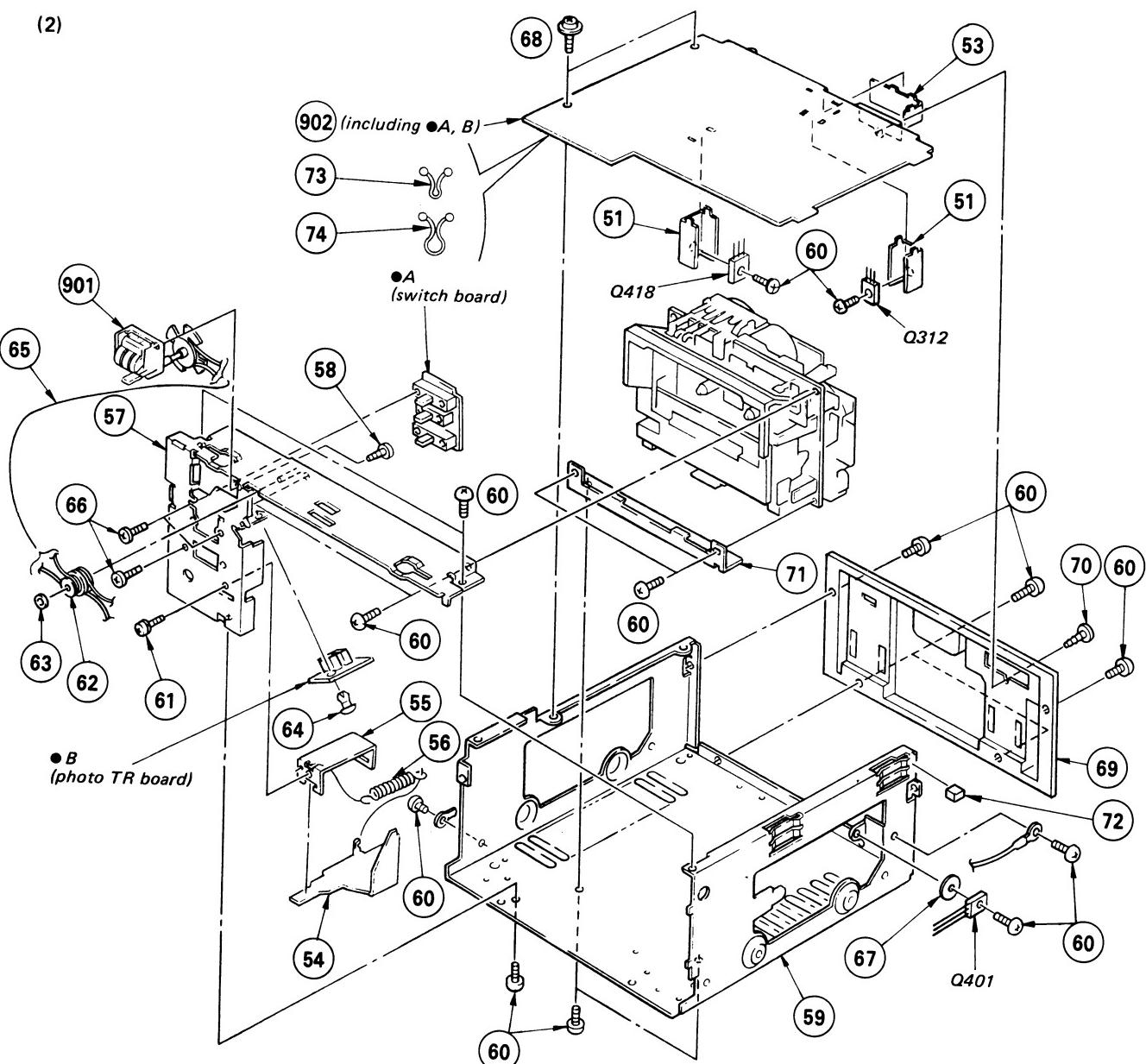
The components identified by shading and mark are critical for safety. Replace only with part number specified.



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	*3-325-508-01	HOUSE, LED		13	3-325-512-01	SPRING	
2	X-3325-542-1 (E model).....WINDOW ASSY, CASSETTE			14	7-687-202-11	TOTSU, TAPPING PTPWH 2X4	
	X-3325-543-1 (EXCEPT FOR E model)..WINDOW ASSY, CASSETTE			15	*3-325-511-01	PLATE, SHIELD	
3	X-3325-523-1	PANEL ASSY, FRONT		16	7-687-233-11	SCREW, TOTSU PTPWH 2.6X6, TYPE2	
4	X-3325-525-1	ESCIUTCHEON ASSY		17	X-4902-937-1	FOOT ASSY, RUBBER	
5	3-325-506-01	BUTTON (B), STOP		18	3-307-538-21	KNOB, SWITCH, TIMER	
6	3-325-504-01	BUTTON (B), FWD		19	3-575-533-31	BUTTON, EJECT	
7	3-325-505-01	BUTTON (B), REV		20	7-685-871-01	SCREW +BVTT 3X6 (S)	
8	3-325-503-31	BUTTON (B), REC MUTE		21	4-910-078-31	CASE	
9	3-325-503-11	BUTTON, REC		22	4-886-821-01	SCREW, M3 CASE	
10	3-325-503-21	BUTTON (B), PAUSE		23	*3-325-581-01	LABEL, MODEL NUMBER (W)	
11	3-325-503-41	BUTTON, AMS		24	7-623-505-01	LUG, 2	
12	3-325-503-01	BUTTON (B), FF.REW		25	3-703-709-41	STICKER, SONY SYMBOL (15)	
				903	*1-615-390-11	PC BOARD, CONTROL SWITCH	

No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	*3-312-615-31	HEAT SINK		66	7-621-775-10	SCREW +B 2.6X4	
53	*3-325-515-01	PLATE, SHIELD		67	3-572-365-11	SHEET, INSULATING (A)	
54	*3-325-513-01	SLIDER, EJECT		68	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6	
55	*3-575-502-00	BRACKET, EJECT		69	3-309-129-71	PLATE, JACK	
56	3-534-238-XX	SPRING, TENSION		70	7-685-647-14	SCREW +BVTP 3X10 TYPE2 N-S	
57	*X-3325-501-1	CHASSIS ASSY, JOINT		71	*3-319-722-01	BRACLET, MD	
58	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S		72	9-911-841-XX	CUSHION	
59	*3-309-132-12	CHASSIS		73	*2-056-665-00	HOLDER, WIRE (PURSE LOCK 5 DIA)	
60	7-685-871-01	SCREW +BVTT 3X6 (S)		74	*2-056-666-00	PURSE LOCK (8 DIA.)	
61	7-628-254-05	SCREW +PS 2.6X5		901	1-548-563-91	COUNTER, TAPE (MIDDLE TYPE)	
62	3-318-825-01	PULLEY, MIDWAY		902	*A-2056-296-A	MONTEED PCB, AUDIO	
63	3-558-708-21	WASHER, STOPPER		Q312	8-729-154-82	TRANSISTOR 2SB548-R	
64	4-812-134-11	RIVET NYLON, 3.5		Q401	8-729-180-92	TRANSISTOR 2SD809-K	
65	3-325-509-01	BELT (A), SQUARE		Q418	8-729-180-92	TRANSISTOR 2SD809-K	

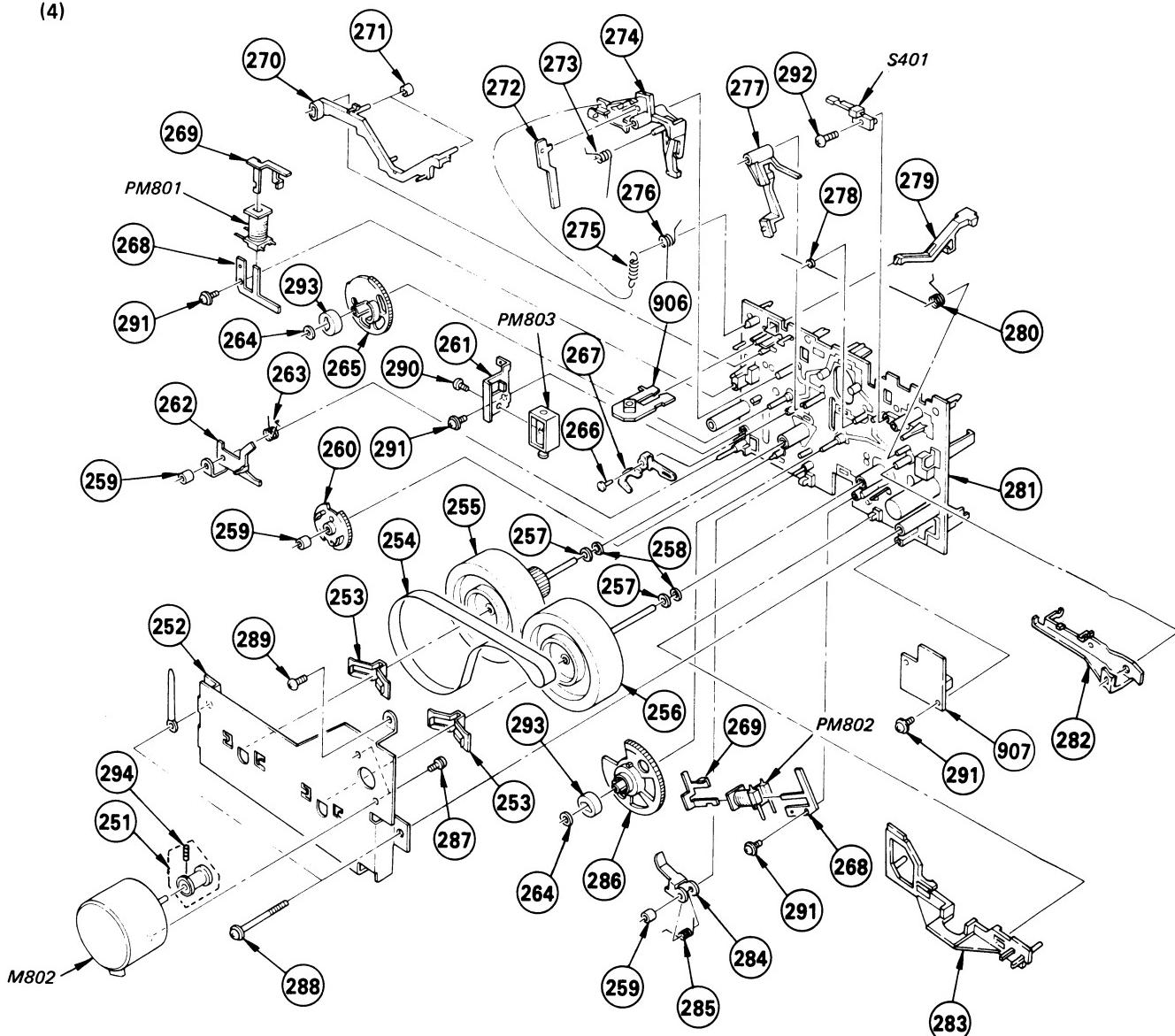
FH-150R **FH-150R**
TC-177R **TC-177R**



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	*3-312-615-31	HEAT SINK		66	7-621-775-10	SCREW +B 2.6X4	
53	*3-325-515-01	PLATE, SHIELD		67	3-572-365-11	SHEET, INSULATING (A)	
54	*3-325-513-01	SLIDER, EJECT		68	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6	
55	*3-575-502-00	BRACKET, EJECT		69	3-309-129-71	PLATE, JACK	
56	3-534-238-XX	SPRING, TENSION		70	7-685-647-14	SCREW +BVTP 3X10 TYPE2 N-S	
57	*X-3325-501-1	CHASSIS ASSY, JOINT		71	*3-319-722-01	BRACLET, MD	
58	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S		72	9-911-841-XX	CUSHION	
59	*3-309-132-12	CHASSIS		73	*2-056-665-00	HOLDER, WIRE (PURCE LOCK 5 DIA)	
60	7-685-871-01	SCREW +BVTT 3X6 (S)		74	*2-056-666-00	PURSE LOCK (8 DIA.)	
61	7-628-254-05	SCREW +PS 2.6X5		901	1-548-563-91	COUNTER, TAPE (MIDDLE TYPE)	
62	3-318-825-01	PULLEY, MIDWAY		902	*A-2056-296-A	MOUNTED PCB, AUDIO	
63	3-558-708-21	WASHER, STOPPER		Q312	8-729-154-82	TRANSISTOR 2SB548-R	
64	4-812-134-11	RIVET NYLON, 3.5		Q401	8-729-180-92	TRANSISTOR 2SD809-K	
65	3-325-509-01	BELT (A), SQUARE		Q418	8-729-180-92	TRANSISTOR 2SD809-K	

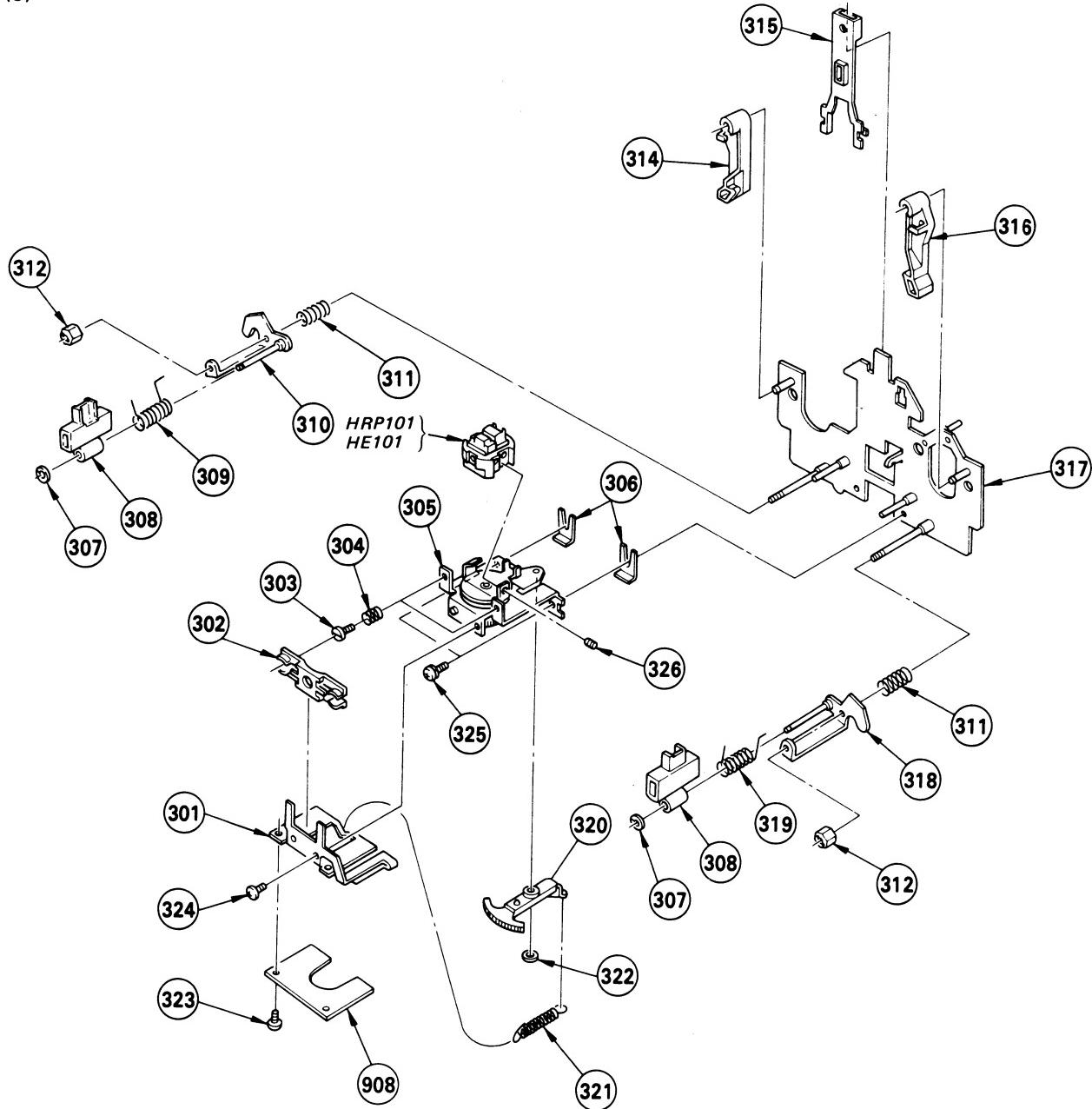
No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
201	7-685-865-01	SCREW +BVTT 2.6X12 (S)		224	3-307-394-00	RETAINER (B), THRUST	
202	3-575-332-00	GEAR, FR		225	3-575-324-00	GEAR, LIMITER	
203	3-319-721-01	SPRING, COMPRESSION		226	3-564-027-11	FELT, LIMITER	
204	3-319-700-01	HOLDER, CASSETTE		227	3-575-304-00	SHAFT, GEAR, FR	
205	3-319-613-01	PISTON (B)		228	X-3319-612-1	MOTOR ASSY, REEL	202, 224-227
206	3-312-441-00	RING, PISTON		229	3-575-457-00	PLATE (B), SHIELD, MOTOR	
207	3-313-292-11	RETAINER, CASSETTE		230	*3-319-615-01	LEVER (RIGHT), BACK TENSION	
208	3-319-607-01	BUSHING, REEL TABLE		231	3-319-650-01	SPRING (R)	
209	3-319-657-01	PULLEY (B) CB		232	*3-319-652-01	PLATE (RIGHT), LIMITER	
210	3-325-510-01	BELT (B), SQUARE		233	X-3319-607-1	PINCH LEVER ASSY	
211	X-3319-617-1	PULLEY ASSY, MOTOR		234	3-319-686-01	SPRING, TENSION	
212	3-319-614-01	SPRING		235	3-319-685-01	SPRING, TENSION	
213	3-319-694-01	SPRING, TENSION		236	3-319-601-01	SPRING	
214	3-575-346-01	FELT, BREKE		237	*3-319-653-01	PLATE (LEFT), LIMITER	
215	*3-319-611-01	LEVER (LEFT), BACK TENSION		238	3-319-651-01	SPRING (L)	
216	3-319-670-01	HOLDER, SWITCH, DETECTION		239	7-671-112-01	STEEL, BALL	
217	3-319-605-01	LEVER, METAL DETECTION		240	7-621-775-60	SCREW +B 2.6X12	
218	3-319-603-01	LEVER, REC DETECTION		241	7-671-112-11	BALL, STEEL	
219	3-319-604-01	LEVER, HALF DETECTION		242	7-685-102-21	SCREW +PTP 2.6X4 TYPE2 SLIT	
220	3-319-602-01	SPRING		243	7-688-002-01	W 2.6, SMALL	
221	3-319-669-01	LEVER, EJECT		904	*1-614-696-11	PC BOARD, DETECTION SW	
222	3-312-432-00	SPRING, TENSION		905	*1-613-522-11	PC BOARD, TRANSLATION	
223	*3-319-678-01	LEVER, SWITCH LIFT					

(4)



No.	Part No.	Description	REMARKS	No.	Part No.	Description	REMARKS
251	X-3319-617-1	PULLEY ASSY, MOTOR		294	*X-3319-614-1	LEVER ASSY, PAUSE	
252	*3-319-665-01	RETAINER, THRUST		274	3-555-124-00	SPRING, TENSION	
253	3-319-608-01	RETAINER, THRUST		275	3-319-637-01	SPRING (R)	
254	3-319-630-01	BELT (R), CAPSTAN		276	*X-3319-615-1	LEVER ASSY, FWD LOCK	
255	X-3319-606-1	FLYWHEEL (T) ASSY		277	3-319-649-01	SPRING	
256	X-3319-601-1	FLYWHEEL ASSY		278	3-319-666-01	LEVER (RIGHT), REC DETECTION	
257	3-701-438-11	WASHER, 2.5		280	3-319-633-01	SPRING	
258	3-307-482-00	WASHER, LUMILER		281	X-3319-611-1	CHASSIS ASSY, MECHANICAL	
259	3-319-607-01	BUSHING, REEL TABLE		282	*3-319-676-01	LEVER, FWD	
260	3-319-674-01	GEAR, REVERSE CAM		283	*3-319-681-01	SLIDER, REVERSE	
261	*3-319-639-01	BRACKET, TRIGGER PM		284	*3-319-658-01	LEVER, TRIGGER KICK	
262	*3-319-628-01	LEVER, REVERSE TRIGGER		285	3-319-660-01	SPRING	
263	3-319-648-01	SPRING		286	3-319-689-01	GEAR, FWD CAM	
264	3-307-394-00	RETAINER (B), THRUST		287	7-628-253-95	SCREW +PS 2.6X4	
265	3-319-688-01	GEAR, PAUSE CAM		288	7-685-879-01	SCREW +BVTT 3X30 (S)	
266	*3-319-664-01	SHAFT, CONTROL LEVER		289	7-685-646-21	SCREW +BVTP 3X8 (S)	
267	*3-319-683-01	LEVER, CONTROL, TRIGGER		290	7-685-850-01	SCREW +BVTT 2X3 (S)	
268	3-307-332-00	ARBOR, FIXED		291	7-687-204-11	TOTSU PTPWH 2X6 NON-SLIT, TYPE2	
269	3-307-333-00	ARBOR, TRIGGER		292	7-685-792-01	SCREW +PTT 2.6X5	
270	*3-319-668-01	PLATE, BRAKE		293	1-452-202-00	MAGNET	
271	3-319-662-01	RUBBER, BRAKE		294	7-621-733-08	SET-SCT, HEX 2X4 FLAT POINT	
272	3-319-612-01	SPRING		906	*1-612-727-11	PC BOARD, REC DET	
273	3-319-606-01	SPRING		907	*1-614-396-11	PC BOARD, SLIDE SW	

(5)



No.	Part No.	Description	REMARKS	No.	Part No.	Description	REMARKS
301	3-319-620-01	PLATE, ORNAMENTAL, HEAD		312	3-319-638-01	NUT, ADJUSTMENT	
302	3-319-644-01	STOPPER		314	3-319-643-01	LEVER (L), P ROLLER SELECTION	
303	3-319-663-01	SCREW, ADJUSTMENT, AZIMUTH		315	3-319-684-01	PROTECTOR, EDGE	
304	3-307-460-00	SPRING, COMPRESSION		316	3-319-642-01	LEVER (R), P ROLLER SELECTION	
305	X-3319-613-1	BRACKET COMPLETE ASSY, HEAD		317	*X-3319-610-1	CHASSIS ASSY, REVERSE HEAD	
306	3-307-477-01	SEAM (A), HEAD ADJUSTMENT		318	*X-3319-608-1	LEVER (RIGHT) ASSY, GUIDE	
	3-307-477-11	SEAM (A), HEAD ADJUSTMENT		319	3-306-250-00	SPRING (RIGHT)	
	3-307-477-21	SEAM (A), HEAD ADJUSTMENT		320	3-319-625-01	GEAR, ROTARY HEAD	
	3-307-477-31	SEAM (A), HEAD ADJUSTMENT		321	3-306-258-01	SPRING, TENSION	
	3-307-477-41	SEAM (A), HEAD ADJUSTMENT		322	7-624-102-04	STOP RING 1.5	
307	3-307-394-00	RETAINER (B), THRUST		323	7-685-850-01	SCREW +BVTT 2X3 (S)	
	3-306-269-01	GUIDE, TAPE		324	7-627-553-17	SCREW, PRECISION +P 2X2	
309	3-306-249-00	SPRING (LEFT)		325	7-628-253-05	SCREW +PS 2X4	
310	*X-3319-609-1	LEVER (LEFT) ASSY, GUIDE		326	7-621-710-26	SET-SCREW, SLOT 2X3 FLAT POINT	
311	3-537-215-00	SPRING, COMPRESSION		908	*1-612-729-11	PC BOARD, HEAD TRANSLATION	

SECTION 6

ELECTRICAL PARTS LIST

NOTE:

- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

COILS

MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
 UA... : μA..., UPA... : μPA..., UPC... : μPC,
 UPD... : μPD...

The components identified by shading and mark are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
901	1-548-563-91	COUNTER, TAPE (MIDDLE TYPE)				
902	*A-2056-296-A	MAINTAINED PCB, AUDIO				
903	*1-615-390-11	PC BOARD, CONTROL SWITCH				
904	*1-614-696-11	PC BOARD, DETECTION SW				
905	*1-613-522-11	PC BOARD, TRANSLATION				
906	*1-612-727-11	PC BOARD, REC DET				
907	*1-614-396-11	PC BOARD, SLIDE SW				
908	*1-612-729-11	PC BOARD, HEAD TRANSLATION				
C101	1-162-293-31	CERAMIC	820PF	10%	50V	
C102	1-123-384-00	ELECT	10MF	20%	50V	
C103	1-136-157-00	FILM	0.022MF	5%	50V	
C104	1-123-307-00	ELECT	100MF	20%	10V	
C105	1-123-613-00	ELECT	3.3MF	20%	50V	
C106	1-136-157-00	FILM	0.022MF	5%	50V	
C107	1-136-158-00	FILM	0.027MF	5%	50V	
C108	1-123-369-00	ELECT	4.7MF	20%	25V	
C109	1-162-294-31	CERAMIC	0.001MF	10%	50V	
C110	1-123-369-00	ELECT	4.7MF	20%	25V	
C111	1-123-328-00	ELECT	100MF	20%	10V	
C112	1-162-199-31	CERAMIC	10PF	5%	50V	
C113	1-123-356-00	ELECT	10MF	20%	16V	
C114	1-123-369-00	ELECT	4.7MF	20%	25V	
C115	1-123-369-00	ELECT	4.7MF	20%	25V	
C116	1-110-201-00	MYLAR	0.0033MF	5%	50V	
C117	1-123-298-00	ELECT	470MF	20%	6.3V	
C118	1-123-369-00	ELECT	4.7MF	20%	25V	
C119	1-110-203-00	MYLAR	0.0047MF	5%	50V	
C120	1-136-173-00	FILM	0.47MF	5%	50V	
C121	1-136-167-00	FILM	0.15MF	5%	50V	
C122	1-136-155-00	FILM	0.015MF	5%	50V	
C123	1-136-169-00	FILM	0.22MF	5%	50V	
C124	1-136-163-00	FILM	0.068MF	5%	50V	
C125	1-136-161-00	FILM	0.047MF	5%	50V	
C126	1-110-205-00	MYLAR	0.0068MF	5%	50V	
C127	1-136-153-00	FILM	0.01MF	5%	50V	
C128	1-123-369-00	ELECT	4.7MF	20%	25V	
C129	1-123-382-00	ELECT	3.3MF	20%	50V	
C131	1-136-162-00	FILM	0.056MF	5%	50V	
C132	1-123-318-00	ELECT	33MF	20%	10V	
C133	1-136-153-00	FILM	0.01MF	5%	50V	
C134	1-110-200-00	MYLAR	0.0027MF	5%	50V	
C135	1-136-157-00	FILM	0.022MF	5%	50V	
C136	1-110-205-00	MYLAR	0.0068MF	5%	50V	
C138	1-123-369-00	ELECT	4.7MF	20%	25V	
C140	1-136-272-00	FILM	68PF	5%	630V	
C141	1-136-271-00	FILM	56PF	5%	630V	
C201	1-162-293-31	CERAMIC	820PF	10%	50V	

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
C202	1-123-384-00	ELECT	10MF	20%	50V	
C203	1-136-157-00	FILM	0.022MF	5%	50V	
C204	1-123-307-00	ELECT	100MF	20%	10V	
C205	1-123-613-00	ELECT	3.3MF	20%	50V	
C206	1-136-157-00	FILM	0.022MF	5%	50V	
C207	1-136-158-00	FILM	0.027MF	5%	50V	
C208	1-123-369-00	ELECT	4.7MF	20%	25V	
C209	1-162-294-31	CERAMIC	0.001MF	10%	50V	
C210	1-123-369-00	ELECT	4.7MF	20%	25V	
C211	1-123-307-00	ELECT	100MF	20%	10V	
C212	1-162-199-31	CERAMIC	10PF	5%	50V	
C213	1-123-356-00	ELECT	10MF	20%	16V	
C214	1-123-369-00	ELECT	4.7MF	20%	25V	
C215	1-123-369-00	ELECT	4.7MF	20%	25V	
C216	1-110-201-00	MYLAR	0.0033MF	5%	50V	
C217	1-123-298-00	ELECT	470MF	20%	6.3V	
C218	1-123-369-00	ELECT	4.7MF	20%	25V	
C219	1-110-203-00	MYLAR	0.0047MF	5%	50V	
C220	1-136-173-00	FILM	0.47MF	5%	50V	
C221	1-136-167-00	FILM	0.15MF	5%	50V	
C222	1-136-155-00	FILM	0.015MF	5%	50V	
C223	1-136-169-00	FILM	0.22MF	5%	50V	
C224	1-136-163-00	FILM	0.068MF	5%	50V	
C225	1-136-161-00	FILM	0.047MF	5%	50V	
C226	1-110-205-00	MYLAR	0.0068MF	5%	50V	
C227	1-136-153-00	FILM	0.01MF	5%	50V	
C228	1-123-369-00	ELECT	4.7MF	20%	25V	
C229	1-123-382-00	ELECT	3.3MF	20%	50V	
C231	1-136-162-00	FILM	0.056MF	5%	50V	
C232	1-123-318-00	ELECT	33MF	20%	10V	
C233	1-136-153-00	FILM	0.01MF	5%	50V	
C234	1-110-200-00	MYLAR	0.0027MF	5%	50V	
C235	1-136-157-00	FILM	0.022MF	5%	50V	
C236	1-110-205-00	MYLAR	0.0068MF	5%	50V	
C238	1-123-369-00	ELECT	4.7MF	20%	25V	
C240	1-136-272-00	FILM	68PF	5%	630V	
C241	1-136-271-00	FILM	56PF	5%	630V	
C301	1-123-308-00	ELECT	220MF	20%	10V	
C302	1-123-382-00	ELECT	3.3MF	20%	50V	
C303	1-123-306-00	ELECT	47MF	20%	10V	
C304	1-123-306-00	ELECT	47MF	20%	10V	
C305	1-123-308-00	ELECT	220MF	20%	10V	
C306	1-123-321-00	ELECT	220MF	20%	16V	
C307	1-123-381-00	ELECT	2.2MF	20%	50V	
C308	1-123-356-00	ELECT	10MF	20%	16V	

ELECTRICAL PARTS

Ref.No.	Part No.	Description	10MF	20%	16V
C309	1-123-356-00	ELECT	0.47MF	20%	50V
C311	1-123-379-00	ELECT	10MF	20%	16V
C312	1-123-356-00	ELECT	0.0047MF	5%	100V
C313	1-130-289-00	FILM	0.0047MF	5%	100V
C314	1-130-289-00	FILM	0.0082MF	5%	100V
C315	1-130-295-00	FILM	0.0082MF	5%	100V
C316	1-129-713-00	FILM	0.0082MF	10%	630V
C317	1-129-898-00	FILM	0.0022MF	10%	630V
C318	1-129-705-00	FILM	0.0018MF	10%	630V
C319	1-123-321-00	ELECT	220MF	20%	16V
C320	1-123-332-00	ELECT	47MF	20%	16V
C321	1-123-318-00	ELECT	33MF	20%	10V
C401	1-123-333-00	ELECT	100MF	20%	16V
C402	1-123-321-00	ELECT	220MF	20%	16V
C403	1-123-306-00	ELECT	47MF	20%	10V
C404	1-123-298-00	ELECT	470MF	20%	6.3V
C405	1-162-304-31	CERAMIC	0.0047MF	20%	16V
C406	1-110-206-00	MYLAR	0.0082MF	5%	50V
C407	1-123-381-00	ELECT	2.2MF	20%	50V
C408	1-123-356-00	ELECT	10MF	20%	16V
C409	1-123-611-00	ELECT	1MF	20%	50V
C410	1-123-380-00	ELECT	1MF	20%	50V
C411	1-123-307-00	ELECT	100MF	20%	10V
C412	1-123-321-00	ELECT	220MF	20%	16V
C413	1-123-380-00	ELECT	1MF	20%	50V
C414	1-123-380-00	ELECT	1MF	20%	50V
C415	1-123-308-00	ELECT	220MF	20%	10V
C416	1-123-381-00	ELECT	2.2MF	20%	50V
C417	1-161-494-00	CERAMIC	0.022MF	30%	25V
C501	1-123-381-00	ELECT	2.2MF	20%	50V
C502	1-162-284-31	CERAMIC	150PF	10%	50V
C503	1-162-284-31	CERAMIC	150PF	10%	50V
C504	1-123-356-00	ELECT	10MF	20%	16V
C505	1-162-282-31	CERAMIC	100PF	10%	50V
C601	1-161-494-00	CERAMIC	0.022MF	30%	25V
CN1	1-562-068-13	SOCKET, CONNECTOR 13P			
CN301	*1-564-509-11	PLUG, CONNECTOR 6P			
CN302	*1-564-505-11	PLUG, CONNECTOR 2P			
CN303	*1-564-505-11	PLUG, CONNECTOR 2P			
CN401	*1-564-508-11	PLUG, CONNECTOR 5P			
CN402	*1-564-508-11	PLUG, CONNECTOR 5P			
CN403	*1-564-508-11	PLUG, CONNECTOR 5P			
CN801	*1-564-336-00	PIN, CONNECTOR 2P			
CN802	*1-564-338-00	PIN, CONNECTOR 4P			
CN803	*1-564-339-00	PIN, CONNECTOR 5P			
CN805	*1-564-341-11	PIN, CONNECTOR 7P			
CT301	1-141-225-00	CAP, TUNING, TRIMAR			
D101	8-719-107-94	DIODE 1SS202-1			
D102	8-719-107-94	DIODE 1SS202-1			
D201	8-719-107-94	DIODE 1SS202-1			
D202	8-719-107-94	DIODE 1SS202-1			
D301	8-719-107-94	DIODE 1SS202-1			
D302	8-719-107-94	DIODE 1SS202-1			
D303	8-719-107-94	DIODE 1SS202-1			

ELECTRICAL PARTS

Ref.No.	Part No.	Description	8-719-107-94	DIODE 1SS202-1
D304	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D305	8-719-107-94	DIODE 1SS202-1	8-719-910-11	DIODE HZ11A1L
D306	8-719-910-11	DIODE HZ11A1L	8-719-107-94	DIODE 1SS202-1
D307	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D308	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D309	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D310	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE HZ11C2L
D401	8-719-910-18	DIODE HZ11C2L	8-719-910-64	DIODE HZ6B1L
D402	8-719-910-64	DIODE HZ6B1L	8-719-107-94	DIODE 1SS202-1
D403	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D404	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D405	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D406	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D407	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D408	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D409	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D410	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D411	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D412	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D413	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D414	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D415	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D417	8-719-107-94	DIODE 1SS202-1	8-719-107-94	DIODE 1SS202-1
D501	8-719-107-94	DIODE 1SS202-1	8-719-920-03	DIODE GL-8PG1
D502	8-719-107-94	DIODE 1SS202-1	8-719-920-03	DIODE GL-8PG1
D503	8-719-107-94	DIODE 1SS202-1	8-719-920-03	DIODE GL-8PG1
D601	8-719-920-03	DIODE GL-8PG1	8-719-918-65	DIODE GL-1PR102
D602	8-719-920-03	DIODE GL-8PG1	8-719-918-66	DIODE GL-1HY102
D603	8-719-920-03	DIODE GL-8PG1	8-719-918-67	DIODE GL-1EG102
D604	8-719-918-65	DIODE GL-1PR102	8-719-107-94	DIODE 1SS202-1
D605	8-719-918-66	DIODE GL-1HY102	X-3319-616-1	HEAD UNIT ASSY
D606	8-719-918-67	DIODE GL-1EG102	X-3319-616-1	HEAD UNIT ASSY
L101	1-408-923-00	MICRO INDUCTOR 8.2MMH	IC LA3160	
L104	1-408-930-00	MICRO INDUCTOR 33MMH	IC LA3220	
L201	1-408-923-00	MICRO INDUCTOR 8.2MMH	IC CX20187	
IC301	8-759-800-36	IC NJM4558S	IC IC20187	
IC302	8-759-800-92	IC TC9312N-001	IC IC20187	
IC303	8-752-018-70	IC CX10034	IC IC20187	
IC304	8-759-700-08	IC M50761-417P	IC IC20187	
IC401	8-759-204-31	IC TC9312N-001	IC IC20187	
IC402	8-759-700-46	IC CX10034	IC IC20187	
IC501	8-759-602-47	IC M50761-417P	IC IC20187	
L204	1-408-930-00	MICRO INDUCTOR 33MMH	IC IC20187	
L301	1-408-096-00	MICRO INDUCTOR 470UH	IC IC20187	
L501	1-408-579-00	MICRO INDUCTOR 220UH	IC IC20187	
M802	1-541-239-00	MOTOR (CAPSTAIN)	PHI401	8-719-902-90 PHOTO INTERRUPTOR SPI201-20
Q101	8-729-900-89	TRANSISTOR DTC144ES	Q102	8-729-102-03 TRANSISTOR 2SD1020
Q102	8-729-102-03	TRANSISTOR 2SD1020	Q103	8-729-606-33 TRANSISTOR 2SC2603F

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q104	8-729-900-89	TRANSISTOR DTC144ES
Q105	8-729-900-89	TRANSISTOR DTC144ES
Q106	8-729-900-89	TRANSISTOR DTC144ES
Q201	8-729-900-89	TRANSISTOR DTC144ES
Q202	8-729-102-03	TRANSISTOR 2SD1020
Q203	8-729-606-33	TRANSISTOR 2SC2603F
Q204	8-729-900-89	TRANSISTOR DTC144ES
Q205	8-729-900-89	TRANSISTOR DTC144ES
Q206	8-729-900-89	TRANSISTOR DTC144ES
Q301	8-729-606-33	TRANSISTOR 2SC2603F
Q302	8-729-606-33	TRANSISTOR 2SC2603F
Q303	8-729-900-89	TRANSISTOR DTC144ES
Q304	8-729-900-89	TRANSISTOR DTC144ES
Q305	8-729-117-54	TRANSISTOR 2SA1175
Q306	8-729-900-65	TRANSISTOR DTA144ES
Q309	8-729-801-93	TRANSISTOR 2SD1387
Q310	8-729-606-33	TRANSISTOR 2SC2603F
Q311	8-729-606-33	TRANSISTOR 2SC2603F
Q312	8-729-154-82	TRANSISTOR 2SB548-R
Q313	8-729-606-33	TRANSISTOR 2SC2603F
Q314	8-729-606-33	TRANSISTOR 2SC2603F
Q315	8-729-900-89	TRANSISTOR DTC144ES
Q401	8-729-180-92	TRANSISTOR 2SD809-K
Q404	8-729-180-92	TRANSISTOR 2SD809-K
Q405	8-729-117-54	TRANSISTOR 2SA1175
Q406	8-729-900-89	TRANSISTOR DTC144ES
Q407	8-729-900-89	TRANSISTOR DTC144ES
Q408	8-729-900-89	TRANSISTOR DTC144ES
Q409	8-729-900-89	TRANSISTOR DTC144ES
Q410	8-729-900-89	TRANSISTOR DTC144ES
Q411	8-729-900-89	TRANSISTOR DTC144ES
Q412	8-729-900-65	TRANSISTOR DTA144ES
Q413	8-729-900-80	TRANSISTOR DTA114ES
Q414	8-729-801-93	TRANSISTOR 2SD1387
Q415	8-729-801-93	TRANSISTOR 2SD1387
Q416	8-729-801-83	TRANSISTOR 2SB1013
Q417	8-729-801-83	TRANSISTOR 2SB1013
Q418	8-729-180-92	TRANSISTOR 2SD809-K
Q419	8-729-900-89	TRANSISTOR DTC144ES
Q420	8-729-801-93	TRANSISTOR 2SD1387
Q421	8-729-900-65	TRANSISTOR DTA144ES
Q422	8-729-900-89	TRANSISTOR DTC144ES
Q423	8-729-900-65	TRANSISTOR DTA144ES
Q424	8-729-900-65	TRANSISTOR DTA144ES
Q425	8-729-900-65	TRANSISTOR DTA144ES
Q426	8-729-900-65	TRANSISTOR DTA144ES
Q501	8-729-900-65	TRANSISTOR DTA144ES
Q502	8-729-900-65	TRANSISTOR DTA144ES
Q601	8-729-606-33	TRANSISTOR 2SC2603F
R101	1-249-434-11	CARBON 27K 5% 1/6W
R102	1-247-883-00	CARBON 150K 5% 1/6W
R103	1-249-425-11	CARBON 4.7K 5% 1/6W
R104	1-247-808-00	CARBON 110 5% 1/6W
R105	1-249-421-11	CARBON 2.2K 5% 1/6W
R106	1-249-421-11	CARBON 2.2K 5% 1/6W
R107	1-247-841-00	CARBON 2.7K 5% 1/6W
R108	1-247-887-00	CARBON 220K 5% 1/6W
R109	1-247-823-00	CARBON 470 5% 1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Value	Tolerance	Power
R110	1-249-437-11	CARBON	47K	5%	1/6W
R111	1-247-829-00	CARBON	820	5%	1/6W
R112	1-249-421-11	CARBON	2.2K	5%	1/6W
R113	1-247-859-00	CARBON	15K	5%	1/6W
R114	1-247-815-00	CARBON	220	5%	1/6W
R115	1-247-827-00	CARBON	680	5%	1/6W
R116	1-249-429-11	CARBON	10K	5%	1/6W
R117	1-249-419-11	CARBON	1.5K	5%	1/6W
R118	1-247-831-00	CARBON	1K	5%	1/6W
R119	1-247-831-00	CARBON	1K	5%	1/6W
R120	1-247-831-00	CARBON	1K	5%	1/6W
R121	1-247-846-00	CARBON	4.3K	5%	1/6W
R122	1-247-841-00	CARBON	2.7K	5%	1/6W
R123	1-249-421-11	CARBON	2.2K	5%	1/6W
R124	1-247-879-00	CARBON	100K	5%	1/6W
R125	1-249-421-11	CARBON	2.2K	5%	1/6W
R126	1-247-822-00	CARBON	430	5%	1/6W
R127	1-247-851-00	CARBON	6.8K	5%	1/6W
R128	1-247-827-00	CARBON	680	5%	1/6W
R129	1-249-433-11	CARBON	22K	5%	1/6W
R130	1-247-841-00	CARBON	2.7K	5%	1/6W
R131	1-249-429-11	CARBON	10K	5%	1/6W
R132	1-247-879-00	CARBON	100K	5%	1/6W
R133	1-247-831-00	CARBON	1K	5%	1/6W
R134	1-247-867-00	CARBON	33K	5%	1/6W
R135	1-247-867-00	CARBON	33K	5%	1/6W
R136	1-247-831-00	CARBON	1K	5%	1/6W
R138	1-247-819-00	CARBON	330	5%	1/6W
R139	1-249-425-11	CARBON	4.7K	5%	1/6W
R140	1-247-849-00	CARBON	5.6K	5%	1/6W
R141	1-247-841-00	CARBON	2.7K	5%	1/6W
R142	1-247-845-00	CARBON	3.9K	5%	1/6W
R143	1-249-421-11	CARBON	2.2K	5%	1/6W
R144	1-247-845-00	CARBON	3.9K	5%	1/6W
R145	1-247-879-00	CARBON	100K	5%	1/6W
R146	1-249-429-11	CARBON	10K	5%	1/6W
R201	1-249-434-11	CARBON	27K	5%	1/6W
R202	1-247-883-00	CARBON	150K	5%	1/6W
R203	1-249-425-11	CARBON	4.7K	5%	1/6W
R204	1-247-808-00	CARBON	110	5%	1/6W
R205	1-249-421-11	CARBON	2.2K	5%	1/6W
R206	1-249-421-11	CARBON	2.2K	5%	1/6W
R207	1-247-841-00	CARBON	2.7K	5%	1/6W
R208	1-247-887-00	CARBON	220K	5%	1/6W
R209	1-247-823-00	CARBON	470	5%	1/6W
R210	1-249-437-11	CARBON	47K	5%	1/6W
R211	1-247-829-00	CARBON	820	5%	1/6W
R212	1-249-421-11	CARBON	2.2K	5%	1/6W
R213	1-247-859-00	CARBON	15K	5%	1/6W
R214	1-247-815-00	CARBON	220	5%	1/6W
R215	1-247-827-00	CARBON	680	5%	1/6W
R216	1-249-429-11	CARBON	10K	5%	1/6W
R217	1-249-419-11	CARBON	1.5K	5%	1/6W
R218	1-247-831-00	CARBON	1K	5%	1/6W
R219	1-247-831-00	CARBON	1K	5%	1/6W
R220	1-247-831-00	CARBON	1K	5%	1/6W
R221	1-247-846-00	CARBON	4.3K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R222	1-247-841-00	CARBON	2.7K	5%	1/6W
R223	1-249-421-11	CARBON	2.2K	5%	1/6W
R224	1-247-879-00	CARBON	100K	5%	1/6W
R225	1-249-421-11	CARBON	2.2K	5%	1/6W
R226	1-247-822-00	CARBON	430	5%	1/6W
R227	1-247-851-00	CARBON	6.8K	5%	1/6W
R228	1-247-827-00	CARBON	680	5%	1/6W
R229	1-249-433-11	CARBON	22K	5%	1/6W
R230	1-247-841-00	CARBON	2.7K	5%	1/6W
R231	1-249-429-11	CARBON	10K	5%	1/6W
R232	1-247-879-00	CARBON	100K	5%	1/6W
R233	1-247-831-00	CARBON	1K	5%	1/6W
R234	1-247-867-00	CARBON	33K	5%	1/6W
R235	1-247-867-00	CARBON	33K	5%	1/6W
R236	1-247-831-00	CARBON	1K	5%	1/6W
R238	1-247-819-00	CARBON	330	5%	1/6W
R239	1-249-425-11	CARBON	4.7K	5%	1/6W
R240	1-247-849-00	CARBON	5.6K	5%	1/6W
R241	1-247-841-00	CARBON	2.7K	5%	1/6W
R242	1-247-845-00	CARBON	3.9K	5%	1/6W
R243	1-249-421-11	CARBON	2.2K	5%	1/6W
R244	1-247-845-00	CARBON	3.9K	5%	1/6W
R245	1-247-879-00	CARBON	100K	5%	1/6W
R246	1-249-429-11	CARBON	10K	5%	1/6W
R301	1-247-224-00	CARBON	220	5%	1/2W
R302	1-249-433-11	CARBON	22K	5%	1/6W
R303	1-247-843-00	CARBON	3.3K	5%	1/6W
R304	1-249-425-11	CARBON	4.7K	5%	1/6W
R305	1-247-875-00	CARBON	68K	5%	1/6W
R306	1-247-903-00	CARBON	1M	5%	1/6W
R307	1-247-807-00	CARBON	100	5%	1/6W
R308	1-247-879-00	CARBON	100K	5%	1/6W
R309	1-247-224-00	CARBON	220	5%	1/2W
R310	1-249-437-11	CARBON	47K	5%	1/6W
R311	1-249-437-11	CARBON	47K	5%	1/6W
R312	1-249-425-11	CARBON	4.7K	5%	1/6W
R313	1-249-437-11	CARBON	47K	5%	1/6W
R314	1-214-777-00	METAL	100K	1%	1/4W
R315	1-249-429-11	CARBON	10K	5%	1/6W
R318	1-249-429-11	CARBON	10K	5%	1/6W
R319	1-249-414-11	CARBON	560	5%	1/6W
R320	1-247-844-00	CARBON	3.6K	5%	1/6W
R321	1-247-848-00	CARBON	5.1K	5%	1/6W
R322	1-249-429-11	CARBON	10K	5%	1/6W
R323	1-247-853-00	CARBON	8.2K	5%	1/6W
R324	1-247-853-00	CARBON	8.2K	5%	1/6W
R325	1-247-080-00	CARBON	5.6	5%	1/4W
R326	1-249-434-11	CARBON	27K	5%	1/6W
R327	1-249-429-11	CARBON	10K	5%	1/6W
R328	1-247-831-00	CARBON	1K	5%	1/6W
R329	1-249-421-11	CARBON	2.2K	5%	1/6W
R330	1-247-831-00	CARBON	1K	5%	1/6W
R331	1-249-421-11	CARBON	2.2K	5%	1/6W
R332	1-247-879-00	CARBON	100K	5%	1/6W
R401	1-247-751-11	CARBON	820	5%	1/2W
R404	1-247-212-00	CARBON	68	5%	1/2W
R405	1-247-212-00	CARBON	68	5%	1/2W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R406	1-249-421-11	CARBON	2.2K	5%	1/6W
R407	1-247-867-00	CARBON	33K	5%	1/6W
R408	1-249-425-11	CARBON	4.7K	5%	1/6W
R409	1-247-811-00	CARBON	150	5%	1/6W
R410	1-247-823-00	CARBON	470	5%	1/6W
R411	1-247-815-00	CARBON	220	5%	1/6W
R412	1-247-815-00	CARBON	220	5%	1/6W
R413	1-247-819-00	CARBON	330	5%	1/6W
R414	1-249-429-11	CARBON	10K	5%	1/6W
R415	1-247-879-00	CARBON	100K	5%	1/6W
R416	1-249-433-11	CARBON	22K	5%	1/6W
R417	1-249-433-11	CARBON	22K	5%	1/6W
R418	1-249-429-11	CARBON	10K	5%	1/6W
R419	1-249-437-11	CARBON	47K	5%	1/6W
R420	1-249-425-11	CARBON	4.7K	5%	1/6W
R421	1-249-437-11	CARBON	47K	5%	1/6W
R422	1-247-879-00	CARBON	100K	5%	1/6W
R423	1-247-831-00	CARBON	1K	5%	1/6W
R424	1-247-879-00	CARBON	100K	5%	1/6W
R425	1-249-429-11	CARBON	10K	5%	1/6W
R426	1-247-859-00	CARBON	15K	5%	1/6W
R427	1-247-831-00	CARBON	1K	5%	1/6W
R428	1-247-831-00	CARBON	1K	5%	1/6W
R429	1-247-831-00	CARBON	1K	5%	1/6W
R430	1-247-831-00	CARBON	1K	5%	1/6W
R431	1-247-832-00	CARBON	1.1K	5%	1/6W
R432	1-249-419-11	CARBON	1.5K	5%	1/6W
R433	1-249-419-11	CARBON	1.5K	5%	1/6W
R434	1-247-831-00	CARBON	1K	5%	1/6W
R437	1-249-432-11	CARBON	18K	5%	1/6W
R438	1-247-795-00	CARBON	33	5%	1/6W
R439	1-249-429-11	CARBON	10K	5%	1/6W
R440	1-249-429-11	CARBON	10K	5%	1/6W
R441	1-247-857-00	CARBON	12K	5%	1/6W
R442	1-249-425-11	CARBON	4.7K	5%	1/6W
R443	1-247-809-00	CARBON	120	5%	1/6W
R444	1-247-833-00	CARBON	1.2K	5%	1/6W
R445	1-247-869-00	CARBON	39K	5%	1/6W
R446	1-247-873-00	CARBON	56K	5%	1/6W
R447	▲1-217-391-00	FUSIBLE	22	5%	1/4W F
R448	1-249-421-11	CARBON	2.2K	5%	1/6W
R501	1-249-429-11	CARBON	10K	5%	1/6W
R502	1-247-903-00	CARBON	1M	5%	1/6W
R503	1-247-841-00	CARBON	2.7K	5%	1/6W
R504	1-247-879-00	CARBON	100K	5%	1/6W
R505	1-249-432-11	CARBON	18K	5%	1/6W
R506	1-249-425-11	CARBON	4.7K	5%	1/6W
R507	1-249-433-11	CARBON	22K	5%	1/6W
R601	1-247-809-00	CARBON	120	5%	1/6W
R602	1-249-429-11	CARBON	10K	5%	1/6W
R603	1-247-867-00	CARBON	33K	5%	1/6W
RV101	1-228-995-00	RES, ADJ, CARBON	22K		
RV102	1-228-994-00	RES, ADJ, CARBON	10K		
RV201	1-228-995-00	RES, ADJ, CARBON	22K		
RV202	1-228-994-00	RES, ADJ, CARBON	10K		
RY301	1-515-535-11	RELAY			

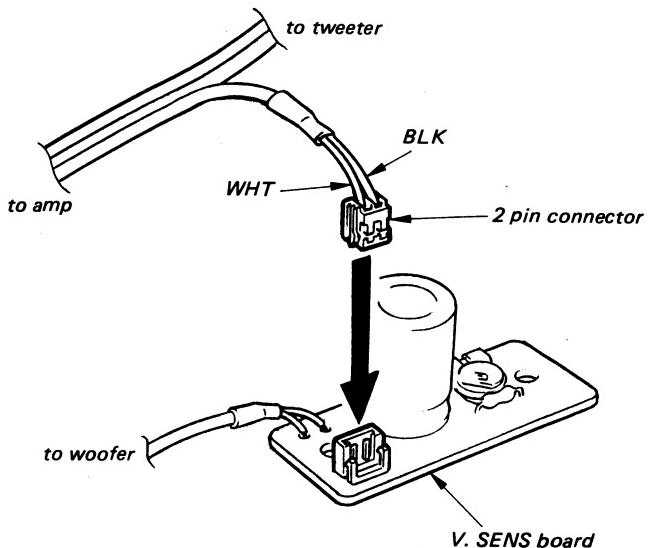
ELECTRICAL PARTS

<u>Ref.No.</u>	<u>Part No.</u>	<u>Description</u>
S1	1-554-691-00	SWITCH, SLIDE (DOLBY NR)
S2	1-554-691-00	SWITCH, SLIDE (TIMER)
S3	1-514-674-21	SWITCH, SLIDE (DIRECTION)
S301	1-554-277-00	SWITCH, SLIDE (ISS)
S601	1-553-856-00	SWITCH, KEY BOARD (STOP)
S602	1-553-856-00	SWITCH, KEY BOARD (REW)
S603	1-553-856-00	SWITCH, KEY BOARD (FF)
S604	1-553-856-00	SWITCH, KEY BOARD (FWD)
S605	1-553-856-00	SWITCH, KEY BOARD (REV)
S606	1-553-856-00	SWITCH, KEY BOARD (PAUSE)
S607	1-553-856-00	SWITCH, KEY BOARD (REC)
S608	1-553-856-00	SWITCH, KEY BOARD (REC MUTE)
S609	1-553-856-00	SWITCH, KEY BOARD (AMS)
S801	1-554-883-11	SWITCH, SLIDE (DIRECTION)
S802	1-553-856-00	SWITCH, KEY BOARD (HALF DET)
S803	1-553-856-00	SWITCH, KEY BOARD (70/120 U)
S804	1-553-856-00	SWITCH, KEY BOARD (METAL)
S805	1-553-856-00	SWITCH, KEY BOARD (ERASE PROOF/FWD)
S806	1-553-856-00	SWITCH, KEY BOARD (ERASE PROOF/REV)
SPK101	1-235-186-00	ENCAPSULATED COMPONENT
SPK201	1-235-186-00	ENCAPSULATED COMPONENT
T301	1-433-281-11	TRANSFORMER, BIAS OSCILLATOR
X501	1-527-532-00	OSCILLATOR, CERAMIC

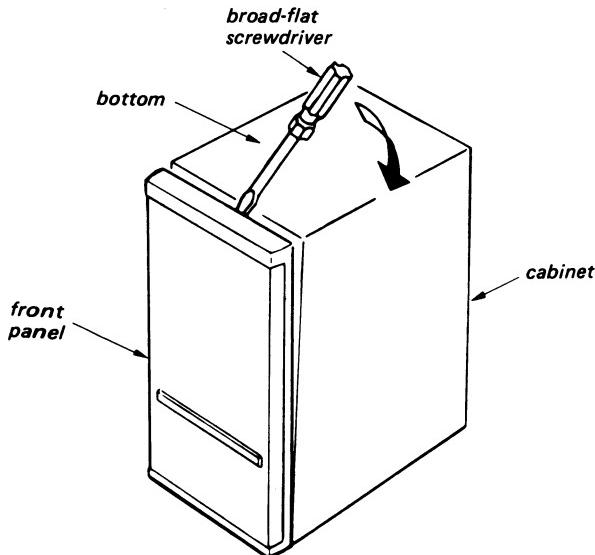
SPEAKER SYSTEM [APM-177M]

[NOTES ON REPLACING WOOFER UNIT AND V. SENS BOARD]

- As woofer unit and V. SENS board (fixed on rear plate of speaker cabinet) are supplied as a block, replace them at the same time. Be sure to discard former V. SENS board. After replacing, there is no problem even if V. SENS board gets out of fixed position a little.
- Adjustable resistor (RV101) on V. SENS board has already adjusted with woofer unit. Therefore do not adjust it.
- Be sure to insert 2 pin connector as illustrated on the right.

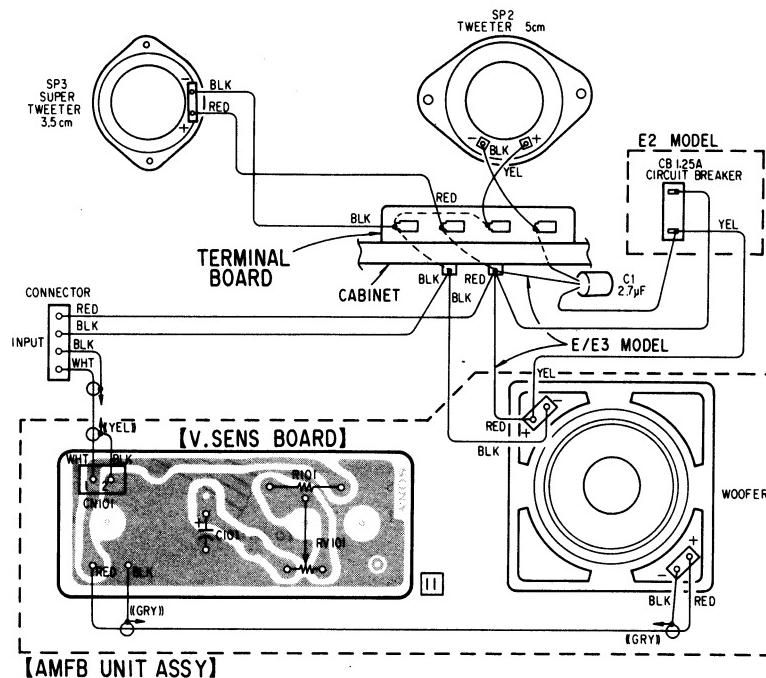


1. DISASSEMBLY FRONT PANEL REMOVAL

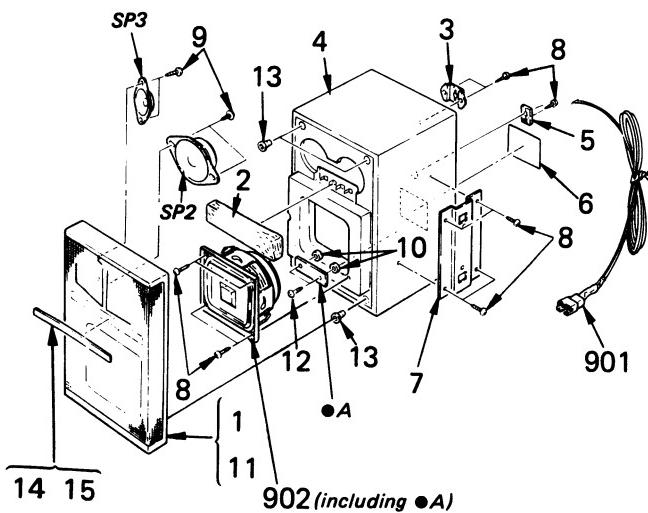


Note: Be careful not to scratch the cabinet.

2. WIRING DIAGRAM



3. EXPLODED VIEW AND PARTS LIST



No.	Part No.	Description	Remarks
1	X-4910-067-1	PANEL (LEFT) ASSY (B), FRONT	
2	*4-910-045-01	ABSORBENT (C), ACOUSTIC	
3	*4-883-959-01	HOOK	
4	X-4910-046-1	CABINET ASSY, SPEAKER	
5	*4-914-306-01	CLAMP	
6	*4-910-397-01	(E)...LABEL, MODEL NUMBER	
	*4-914-311-01	(E2)...LABEL, MODEL NUMBER	
	*4-914-312-01	(E3)...LABEL, MODEL NUMBER	
7	*4-902-981-11	PLATE (B), SIDE	
8	4-874-614-11	SCREW (4)(3.5X14), TAPPING	
9	7-685-646-71	SCREW +BVTP 3X8 TYPE2 SLIT	
10	4-846-456-02	FOOT, FELT	
11	X-4910-068-1	PANEL (RIGHT) ASSY (B), FRONT	
12	7-685-148-01	SCREW +P 3X12 TYPE1	
13	*4-872-922-02	CATCHER	
14	4-914-332-01	PLATE (LEFT), ORNAMENTAL	
15	4-914-331-01	PLATE (RIGHT), ORNAMENTAL	

ELECTRICAL PARTS

Ref.No.	Part No.	Description
901	1-558-469-11	CORD, SPEAKER
902	X-4910-076-1 X-4910-077-1	(E).....AMFB UNIT ASSY (E2/3)...AMFB UNIT ASSY
C1	1-123-545-00	ELECT 2.7MF 20% 50V
C101	1-123-311-00	CAP, ELECT 1000MF
CB	1-532-664-00	(E2)...CIRCUIT BREAKER , 1.25A
R101	1-247-698-11	RES, CARBON 68
SP2	1-503-590-11	SPEAKER (5CM CONE TYPE)
SP3	1-503-591-11	SPEAKER (3.5CM)